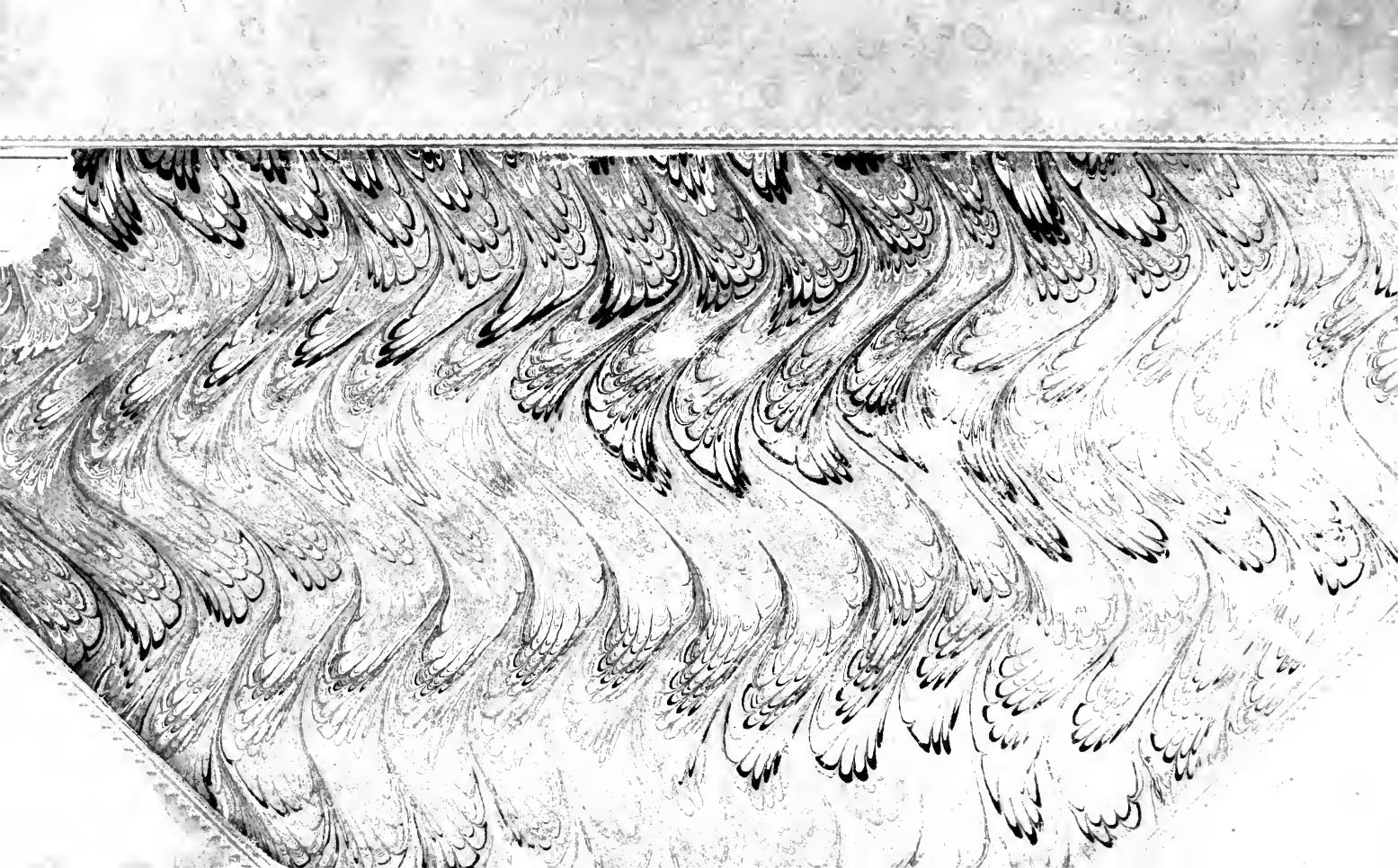

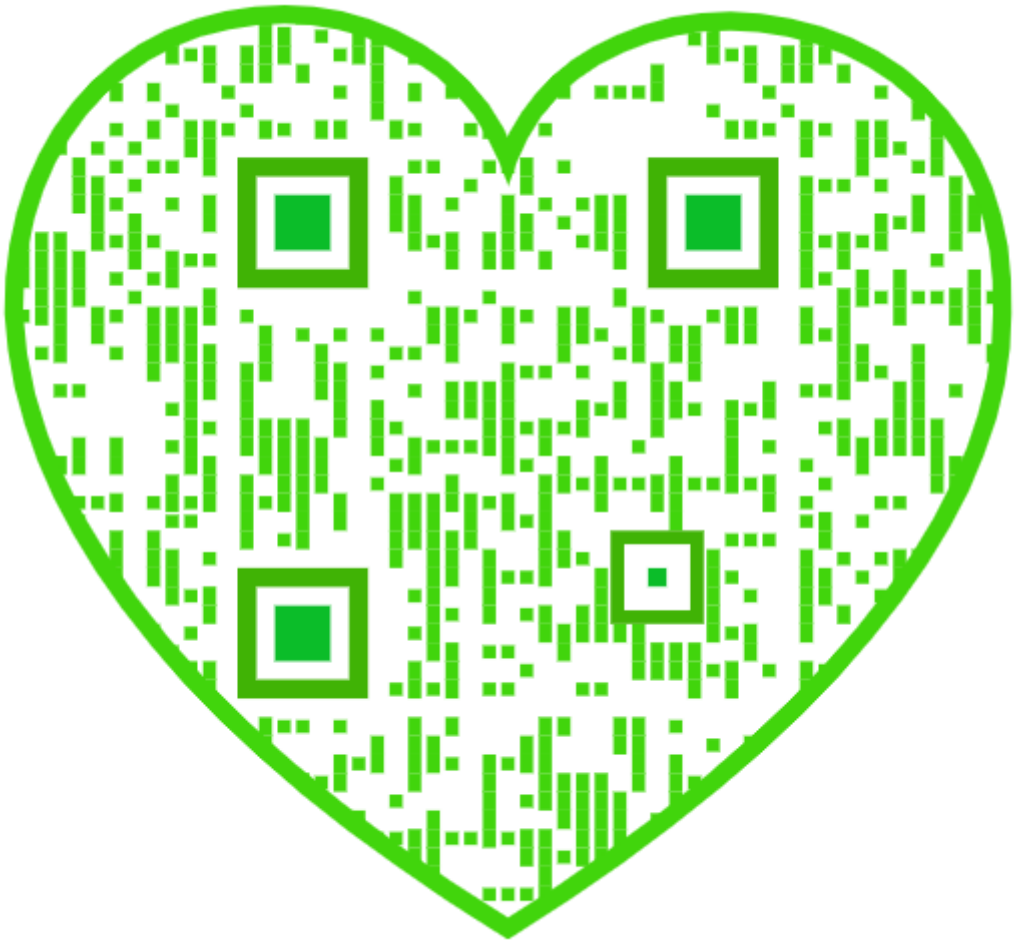

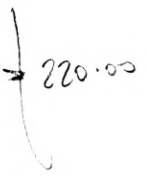
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THE WOODLANDS:

OR,

A TREATISE

On the preparing of ground for planting; on the planting; on the cultivating; on the pruning; and on the cutting down of Forest Trees and Underwoods;

DESCRIBING

The usual growth and size and the uses of each sort of tree, the seed of each, the season and manner of collecting the seed, the manner of preserving and of sowing it, and also the manner of managing the young plants until fit to plant out;

THE TREES

Being arranged in Alphabetical Order, and the List of them, including those of America as well as those of England, and the English, French, and Latin name being prefixed to the directions relative to each tree respectively.

BY WILLIAM COBBETT.

LONDON:

PRINTED AND PUBLISHED BY WILLIAM COBBETT,
No. 183, FLEET-STREET.

1825.

DEDICATION.

TO

WILLIAM BUDD, Esq.

CLERK OF THE PEACE FOR THE COUNTY OF BERKS.

Kensington, 1st December, 1825.

My dear Sir,

The following work, which relates to a subject that has, in all the various situations of life, even from my boyish days, engaged my attention and been to me a source of delight, I dedicate to you, in order that my children may, when they can no longer hear it from their father's lips, have, what I hope may be, a lasting record of an expression of that great respect and affection that I bear you, on account of your numerous excellent qualities; and particularly on account of your constant exertions in behalf of that now-suffering class, without whose labour there can be no trees to shade, no houses to lodge, no clothes to cover, and no corn to feed us. Those exertions, so judicious, so unwearied, and so free from all ostentation, are the subject of admiration with all who have the happiness to know you; but, I trust, with no one in a higher degree than with

Your faithful Friend

And most obedient Servant,

Wm. COBBETT.

PREFACE.

1. It will be unnecessary for me to say, here, any thing about the manner, in which the divers parts of this work will be arranged, seeing that that has been so fully described in the title of the work itself. Nor need I say any thing about the profit attending the planting of trees; because, occasions enough will, hereafter, offer for the doing of that; and, besides, the profit depends upon the judicious application of the means which the planter may possess. I shall, therefore, here confine myself to a few remarks, on what appears to me to be the defects in all the works of this kind which I have ever seen. They all leave something, and something of importance too, *untold* to us. They begin in the middle of the subject very frequently, and end, as frequently, somewhere about where they ought to begin. Many years ago, I wished to know, whether I could raise Birch trees from the *seed*. I looked into two French books and into two English ones, without being able to learn a word about the matter. I then looked into the great book of knowledge, the ENCYCLOPEDIA BRITANNICA: there I found, in the general dictionary, "BIRCH TREE, *see* BETULA: Botany Index." I

hastened to BETULA, with great eagerness; and there I found, "BETULA, *see* BIRCH TREE." That was *all;* and this was pretty encouragement to one who wanted to get, from books, knowledge about the propagating and the rearing of trees.

2. Some writers give you the mere *botany* of the tree; others its qualities as *timber;* others tell you what *ground* it delights in; others treat of the act of *planting;* others of *pruning* and *cultivation;* but no book that I ever yet saw told me *every thing* that I ought to know, from the *gathering of the seed*, to the rearing up and the cutting down of the tree.

3. This is what I shall endeavour to do for my readers in the course of this work; and, as I proceed, I shall, I trust, take care, in all cases where it may be found necessary, to give the *reasons* for doing that which I advise to be done. Rules, without reasons, have not a thousandth part of the weight which they have when accompanied with reasons. They savour of arbitrary commands, and are seldom received with any great degree of docility or attention.

4. I shall begin by giving instructions for *preparing the ground;* for *planting;* and for *cultivating* after planting. These instructions are applicable to trees of all sorts; and, therefore, they

will properly precede the instructions relative to particular trees. After this will come the trees in alphabetical order; describing, under the head of each tree, the several things mentioned in the title of the work; so that, the attentive and diligent reader will, when he sees a seed upon a tree, know what to do with that seed, so that it may, in due time, become a tree.

5. The inducements to create property by tree-planting are so many and so powerful, that, to the greater part of those who possess the means, little, I hope, need be said to urge them to the employing of those means. Occasions enough will offer for showing how *quickly* the profits come. But, still there are some persons, who possess such means, who are well assured of the ultimate gain, but who are, nevertheless, discouraged by the thought that they shall *not live* to see the actual pecuniary product of their undertaking, and who, according to the idea of that dismal moralist, Dr. JOHNSON, begin *to think of dying* when they are exhorted to plant a tree. Let all such attend to the lesson given them in LA FONTAINE's beautiful Fable of the "OLD MAN AND THE THREE YOUNG MEN," the wise, the generous, the noble sentiments of which ought to be implanted in every human breast.

UN octogénaire plantoit.
Passe encor de *bâtir*; mais *planter* à cet âge.
Disoient trois jouvenceaux, enfants du voisinage;
Assurément il radotoit.

Car, au nom des dieux, je vous prie,
Quel fruit de ce labeur pouvez-vous recueillir ?
Autant qu'un patriarche il vous faudroit vieillir.
A quoi bon charger votre vie
Des soins d'un avenir qui n'est pas fait pour vous ?
Ne songez désormais qu'à vos erreurs passées.
Quittez le long espoir et les vastes pensées ;
Tout cela ne convient qu'à nous.
Il ne convient pas à vous-mêmes,
Repartit le vieillard. Tout établissement
Vient tard et dure peu. La main des Parques blêmes
De vos jours et des miens se joue également.
Nos termes sont pareils par leur courte durée.
Qui de nous des clartés de la voûte azurée
Doit jouir le dernier ? Est-il aucun moment
Qui vous puisse assurer d'un second seulement ?
Mes arrière-neveux me devront cet ombrage :
Hé bien ! défendez-vous au sage
De se donner des soins pour le plaisir d'autrui ?
Cela même est un fruit que je goûte aujourd'hui :
J'en puis jouïr demain, et quelques jours encore ;
Je puis enfin compter l'aurore
Plus d'une fois sur vos tombeaux.
Le vieillard eut raison : l'un des trois jouvenceaux
Se noya dès le port, allant à l'Amérique ;
L'autre, afin de monter aux grandes dignités,
Dans les emplois de Mars servant la république,
Par un coup imprévu vit ses jours emportés ;
Le troisieme tomba d'un arbre
Que lui-même il voulut enter :
Et pleurés du vieillard, il grava sur leur marbre
Ce que je viens de raconter.

6. To *translate* this is like an attempt to make a thing to resemble the Rainbow; and, therefore, I beg those who may happen not to understand French, to be pleased to receive, from my pen, the following statement of the mere prosaic meaning of these words of this absolutely inimitable writer,

who, in marks of simplicity the most pleasing that ever followed the movements of a pen, has, on numerous subjects, left, to ages unborn, philosophy the most profound and sentiments the most just and exalted.

A MAN OF FOURSCORE was planting trees. "To "*build* might pass; but, to *plant* at such an age!" exclaimed THREE YOUNG MEN of the neighbourhood. "Surely," said they, "you are doating; "for, in God's name, what *reward* can you receive "for this, unless you were to live as long as one "of the Patriarchs? What *good* can there be in "loading your life with cares about a time which "you are destined never to see? Pray devote the "rest of your life to thoughts on your past errors; "give up distant and grand expectations: these "become only us YOUNG MEN."—"They become "not even you," answered the OLD MAN. "All "we do comes late, and is quickly gone. The pale "hand of fate sports equally with your days and "with mine. The shortness of our lives puts us "all on a level. Who can say which of us shall "last behold the light of heaven? Can any mo- "ment of your lives secure you even a second "moment? My great grand-children will owe "shady groves to me: And, do you blame me for "providing delight for others! Why, the thought "of this is, of itself, a *reward* which I *already* "enjoy; I may enjoy it to-morrow, and for some "days after that; nay, I may more than once "even see the sun rise on your graves." The OLD MAN was right: one of the three, ambitious to see the New World, was drowned in the port; another, pursuing fame in the service of Mars, was suddenly stopped by an unexpected shot; the third fell from a tree, on which he himself was putting a graff: and the OLD MAN, lamenting their sad end, engraved on their tomb the story here related.

7. I do not pretend, that, in publishing this work, I am actuated *solely* by a desire to promote public and private utility. There is the gratification of my own taste, the indulgence of my own delight in talking about trees; and there are, besides, the more ordinary motives of fame and profit: but, I think I do myself no more than justice, in saying, that the work must necessarily have a tendency to produce good, both public and private; while it will always be a singular satisfaction to me to reflect, that it may tend to induce, here and there, a father of a family to point out to his sons and daughters, that it is more honourable, and attended with more happiness, to be provided with competent and secure fortunes by the sowing and the planting of trees, than by endeavouring to succeed in attaining that object after the manner of the base Jews and Jobbers, who win their half-millions by "watching "the turn of the market."

8. I shall, throughout the work, *number the paragraphs*, and not *the pages*; the former being much the most convenient for purposes of reference: and, at the close, I shall give an INDEX, referring to the several matters which the work contains.

WM. COBBETT,

Kensington, 1st December, 1825.

THE WOODLANDS:

OR,

A TREATISE, &c.

GENERAL INSTRUCTIONS,

RELATIVE TO TREE-PLANTING.

Of the sorts of ground, in which to plant Timber Trees and Underwood.

Of the method of preparing the ground for planting, and of the expense.

Of fencing the ground.

Of the times of the year, and of the weather, for planting.

Of the age and size of the Plants, and of preparing their roots for planting.

Of the method of performing the work of planting.

OF THE SORTS OF GROUND.

9. Under the name of each sort of tree will be mentioned the sort of ground in which it ought to be planted, or in which it may be planted with a fair chance of success. I shall, therefore, here, merely describe the sorts of ground that we commonly find in England. 1. A black mould with a brown mould under it, and then, at a pretty good depth, sand, or gravel, or brick-earth, or clay, or a stone of some sort. 2. A reddish loose loam, with stone of some

sort beneath it. 3. A brown loose loam, with gravel, sand, brick-earth, or clay or stone beneath. 4. A stiff and reddish loam, with large flints (yellow outside and whitish inside) amongst it, and with chalk, at various depths, beneath. 5. A loose grey earth, full of flints (grey outside and blue inside) on a bed of chalk, not far distant. 6. A marley top soil with chalk beneath. 7. A marley soil with grey, or white, stone beneath. 8. A stiff loam with clay beneath, and not far from it. 9. A loose sandy loam with brick-earth beneath. 10. A loose sandy loam with clear white sand to a great depth beneath. 11. A very light reddish sandy loam with red sand, or sand-stone, beneath. 12. A black-grey sandy loam, with sand or sand-stone not far beneath. 13. A stiff loam, mixed with small gravel at top, and with clay beneath. 14. A loose grey soil, mixed with pebbles, at top, and a bed of gravel beneath. 15. Boggy ground. 16. Stiff ground with water not far beneath. 17. Water-sides.

10. There are several other sorts of ground; so great is, indeed, the variety, that it would require a volume, much larger than this will be, barely to give any thing approaching towards a full and accurate description of each. Here is, however, enough for any practical purpose; for, the difference between any one of the above-mentioned soils and any other, approaching in nature towards it, is not, as to its capacity for bearing trees, so great as to make the remarks, applicable to the former, inapplicable to the latter.

PREPARING THE GROUND FOR PLANTING.

11. How many millions have been *thrown away* in planting! How many thousands of plantations have, at the end of twenty or fifty years, made a beggarly exhibition;

and how many of them have wholly failed! Yet, no truth is more evident to my mind than this; that no plantation ever failed, except from the manifest error of the proprietor. It is worse than useless to plant, unless you do the *whole thing well;* because, instead of creating a source of profit and of pleasure, you create a source of loss and of mortification. Planters but too often have, when they are about to plant, the word *economy* on their lips; and, they do not treat that word fairly; for, it really means nothing more than *management*, whereas they will have it mean *sparing in expense:* and, then, they abuse it still further by making it mean *positive* sparing: so that, at last, they come to the conclusion, that that is the wisest plan which costs the *least sum* to the acre, without any regard to the sorts of trees or to the manner of planting them.

12. This is, at first sight, very strange; for, when a man is about to sow corn, or plant cabbages, he thinks of the *produce*, as well as of the cost of sowing and planting; and, he expects a crop proportioned to his expense of seed, manure and tillage. But, it would seem, if one were to judge from the manner in which planting is generally executed, that tree-planters care nothing at all about the result; that they think, that, *to plant* is *to plant*, as *to die* is *to die;* that the manner is of very little consequence; and that, therefore, the less the plantation *cost*, the better. It is very well known, that, to spare manure and tillage, in the cultivation of corn, is the sure way to *lose* money. It is very well known, that it is better not to sow corn at all, than to do it badly. And yet men in general, seem wholly to forget this when they are planting trees. The chief cause of this strange way of thinking is, that the returns, from corn-sowing, are near at

hand, and that those from tree-planting are distant; but, though the actual *pecuniary receipts* from tree-planting may be distant; and, though they were (which is not the case) always very distant; still the returns, as to *increase of value of property*, are not more distant, and, indeed, not so distant, as those from the sowing of corn; for, the moment your trees are in the ground, your land is increased in value; and, were it to be sold, would sell, in porportion to the worth of the plantation, for more than it would have sold before. If the trees have had a year or two of growth, that growth makes a further addition to the value of the land; and so on for every year, until the trees be fit for cutting down. If, indeed, it be *immediate annual income* that you want; if you cannot afford to wait for the effects of planting, that is a very good reason for *not planting at all;* but it is no reason for planting in what is called a *cheap* manner.

13. There is another cause for this *cheap* planting, which is the more difficult to counteract as it arises out of a feeling which is almost natural to the heart of man; namely, a desire to possess a *great extent* of plantation. Men in general like to talk, aye, and even to *think*, of the *number of acres* which they have of land, or of any thing growing on land. Nevertheless, as it is perfectly notorious, that it is better to have one acre of good crop of wheat, than a hundred acres of crop which does little more than equal the amount of the seed, why may not one acre of good plantation be worth more than a hundred of bad plantation? I have seen more than a hundred acres, which was planted about twenty-five years before I saw it, planted with firs, birch, and other such things, costing, in trees and planting, about 3*l.* 10*s.* an acre. So that, besides the *fencing* (an expensive thing), here was the sum of 350*l.* There had been no actual receipts from it; and the trees, if cut down and sold, would

hardly have fetched an amount equal to the expenditure and the interest, reckoning not a farthing for the rent of the land. There were, in this tract, about *seven acres* of pretty good land in two little dells. Now, if the owner had planted these with *ash*, or with *chesnut* (not to mention *locust*) at an expense of 12*l.* an acre, the seven acres would, at the time when I saw the plantation, have yielded him two cuttings, worth 15*l.* an acre the first cutting, and 25*l.* an acre the second. So that here would, in the space of twenty-five years, have been (exclusive of fencing) an expenditure of 84*l.*, and a receipt of 280*l.* And, observe, that, in this case, the stools, or stems, would still be ready to go on producing similar crops, once in ten years, for ages. But, then, alas! the owner would have possessed nothing but a bleak heath, with a couple of little coppices in its dells, instead of being the lord of a "hundred acres of woods"!

14. The first thing to be done, in the making of a plantation, is to *trench* the ground to two feet deep at the least. I shall first describe the *work* of trenching, and afterwards give my reasons for the performing of it. You begin by marking out with a line, two feet wide, on one side or end, of your piece of ground. You strain your line across the piece of ground, two feet from the outside of the piece. Then the workmen chop with their spades along against the line. Then, they measure another two feet, and chop along again. When they have thus marked out a few trenches, they begin digging out the first trench, the earth of which, to the depth of two feet, they wheel away to the other end of the piece, to be ready there to fill up the last trench with. I am here supposing the piece of ground to be so small as for the wheeling of the earth not to be distant, and as to cause no inconvenience in taking the

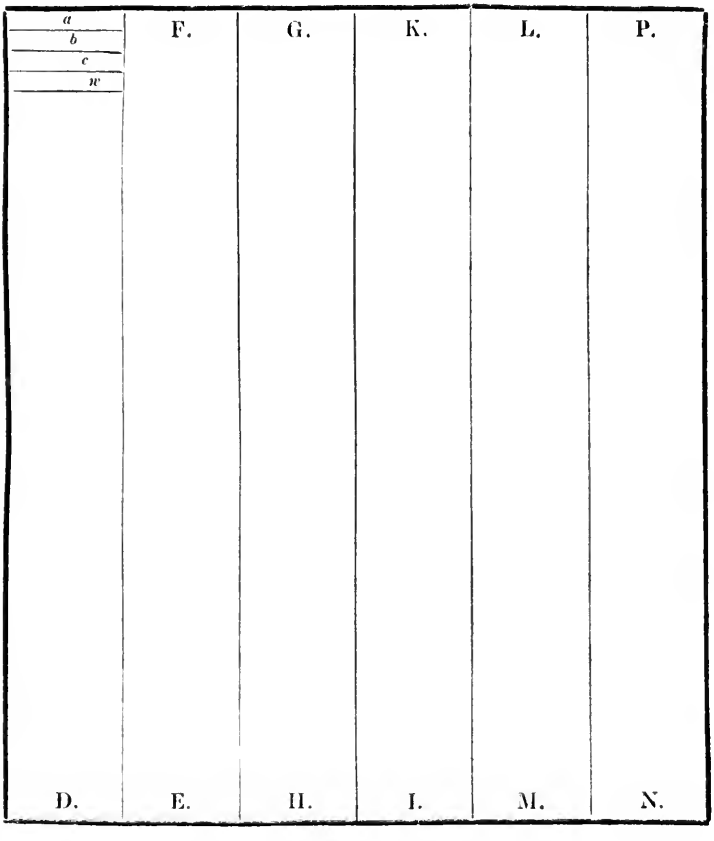
whole width at one trench. But, if the piece of ground be large, it will not be worth while to carry the earth of the first trench away. It may be disposed of by throwing it back, over the ground about to be trenched.

15. Let us suppose a piece of ground containing an acre, and, the rules for trenching such a piece will apply to a piece of any extent. It would, in such a case, even if the outsides were all straight lines, be inconvenient to open at once, so long a trench as would reach from one side to the other. The trench might be in length proportioned to the number of workmen, allowing about half a rod to each, so as not to crowd them too much. Suppose the piece of ground to be 13 rod, or perch, long, and 12 rod wide, which piece will then contain *one acre* all but 4 rod. Let us suppose the sides to be straight, and that four men are to trench this piece of ground.

16. First mark out the piece into *lifts;* that is to say, into *strips* of the width that the men are to trench at a time. They are called *lifts,* because men are said to *carry* so much ground, or space, in their works of the field or garden. A mower, who takes a wide swarth, is said to *carry* more ground than he who takes a narrow one. Any width of ground that is dug, or hoed, at once going along, leaving the rest of the field to be worked on in like manner, is, therefore, called a *lift:* and it is necessary to bear the word in mind. There must be some word to designate the thing, and this is as good as any other.

17. The supposed piece of ground is 12 rod wide and 13 long. Doing the work longwise there will be 6 lifts each of 2 rod wide; and this piece, marked out into *lifts,* let us suppose to be represented by the following lines, which are

as well placed as the thing can be done by mere printing materials.



18. Here is the piece of ground, marked out into lifts, each two rod wide. You begin at *a*, measuring two feet wide, and, with a line, marking out a trench across the *lift*. If you mean to be very nice about it, wheel the earth that comes out of this trench, to the end of the last *lift*, at P, in order to have it ready to fill up the last trench with. But, in ordinary cases, this earth

may be disposed of as mentioned in paragraph 14. You have now got the trench *a* clean out to the depth of two feet. Then you take a spit off the top of trench *b*, and, put it, upside down, at the bottom of trench *a*. Then go on to dig out all the rest of the earth in trench *b*, and lay it in trench *a*, keep the sides and the ends of your trench perpendicular, and go down till you have the trench clean two feet deep in every part of it, laying in trench *a* all that comes out of *b;* and you will find that the earth of trench *a* is now six or seven inches higher than the common surface of the untrenched land. You now proceed to trench *c*, and repeat the operation: and thus you go on, all along the *lift*, to the end D. But, before I speak of what you are to do there, I must observe, that the top spits of *b*, when flung into the bottom of *a*, ought not to be broken, but to be turned in whole; for the more hollow the ground lie the better; and these spits, especially if they be made solid by the roots of grass, will have cavities amongst them at the bottom of the trench, which are a great benefit. It is not necessary, nor is it useful, to make the trenched ground *smooth* at top. It should be *level;* that is to say, not in heaps and holes; but, there is no good, but harm, in breaking it fine and making it smooth, especially if the weather be wet when the work is going on. If you have a mind to do the work *very well*, you will, when you have got trench *a* empty to two feet deep, *dig* it at the bottom of it a spit deep. That is to say, turn the bottom upside down a clean spit deep, which, if the spade be of the right length, and if the digger have some bacon and beer in him, will move the ground another foot down, and this will raise the new ground another two inches.

19. When you come to the end D, you will have a trench

open, and no earth to turn into it. Therefore, you take the earth of the first trench in the next *lift*, at E, and wheel, or throw, it into that open trench, putting the top spits at the bottom, and so on, as before. You have now got a clean open trench to go on along the second *lift*, till you come to F, where you are to fill up your last open trench by taking the earth from the first trench at G. And thus you go on from G to H, from H to I, from I to K, from K to L, from L to M, from M to N, and from N to P, when all your ground will have been turned upside down to the depth of two feet, and when the whole piece will lie six or seven inches higher than it did before.

20. But, the soil may be such, that this operation would turn down to the bottom whatever there is of good mould, and bring to the top something in which hardly any thing will ever strike root; clear chalk, for instance, or pure sand, or gravel, or clay fit to make pots or pipes; or some other hungry stuff, in which the young trees would hardly *live*, and never could grow. When this is the case, the top mould must *still be kept at the top;* but still the trenching must be performed; for the ground must be *moved* and *turned*, to the two feet deep.

21. But here the method of trenching is different from that just described. You begin, as before, by opening the trench *a*, and disposing of the contents as mentioned in paragraph 18. But, then, you do not turn into the bottom of trench *a* the top of trench *b;* you take off the top of trench *b*, a clean spit, or to the depth of the good mould, if that be not a spit deep. You dispose of this top mould of *b*, in the same way as of the contents of *a*. Now, then, you have a clean trench, *a*, two feet deep, and you have along side of it, yet unmoved, all except the top mould of trench *b*.

You then take this remaining part of *b*, and turn it into trench *a*. When that is done, you will have trench *b* clean out, two feet deep; but trench *a* will want its top spit. This you then take from the top of trench *c*, and, throwing it across *b*, place it so as to form the top of *a*, which is then complete, having been moved to two feet deep, and *still having the good mould at the top*. You then take the bottom part of *c* and turn it into *b*; and then you take the top of *w*, and, throwing it across *c*, form with it the top or finishing of *b*, which, like *a*, will then be complete, having, like it, the good mould at top. Thus you go on throughout the whole piece of ground. The only difference between the labour of this method and that of the other method, is, that you have all the top mould to toss to an average distance of three feet, instead of an average distance of one foot; and, in point of expense, this can hardly make an addition of more than a *tenth*; for, when a man has earth upon his spade, it is, unless he be too feeble to be a trencher, of little consequence to him whether he toss it three feet or one foot.

22. When once young trees have *got root*, they will send their roots down into almost any thing that *has been moved*. Besides, though the old top does, in this case, not go to the bottom, that which is next to the old top goes to the bottom; and there is, moreover, such a *mixture* takes place as produces a fermentation; and this has great power in keeping the ground moist in dry weather, and in making it favourable for all sorts of plants. But it must be observed, that when you use this mode of trenching, which is to keep the top mould still at the top, the ground should be *clean*, free from grass and perennial weeds; for these, being so near the top of the trenched ground, would not be killed by the trenching, and would be exceedingly troublesome

afterwards, when they could be extirpated only by great labour. The plough and the harrow and the fire must, in *this case*, prepare the top before the trenching begins; but, in the other case, where the top is to go to the bottom, it is, for the reason before stated, rather an advantage to have the top spit go down in solid lumps; but if there be any *dock*, *thistle*, or *dandelion* roots, they ought to be carefully taken out in the trenching, for no depth of burying will kill *them*.

23. If the bottom be of *clay*, of even the stiffest kind, and if there be *plenty of manure* at hand, it may do very well to put the top mould down to the bottom of the trench; but if you have not plenty of manure, the clay at top is bad, and young trees will be a very long while before they make any progress. And, as to sheer sand, or chalk, or sand-stone, these, if brought up to the top, will be ages before they become fit for planting. In short, if you cannot manure well, or bring up a pretty good soil from the bottom, you should, by all means, keep the old top soil still at top. When the trees have stricken into that, their roots will go down into almost any soil that has been recently moved, but they will not strike at first in such poor and raw soil. This being the case, and it being also the case that plantations are generally made in land where the bottom is not of a good quality, it is necessary to think of the manner of preparing the top soil previous to trenching.

24. If the ground, intended for that mode of trenching which keeps the top soil still at the top, be covered with *grass* and *perennial* weeds, or if it be *green turf*, it ought to be broken up with the plough, and made clean by the harrow, and by burning the roots of the grass and weeds, just the same as if about to be used as arable land. If the

ground be covered with *heath* or *furze* (sometimes called *goss*, and sometimes *ling*), the heath and furze, if not worth any thing as fuel, and, at any rate their roots, ought to be grubbed up, and burnt in *large heaps*, at regular distances on the ground. The readiest way of grubbing the heath, is to do it by cutting off a thin turf all over the ground. This turf will, when dry, burn very well, and will make a great quantity of ashes. When the trenchers have worked up to one of these heaps of ashes, they spread the heap over the trenched ground; so that when the whole piece is trenched, it will have a dressing of ashes upon it, and this will very materially help the young trees.

25. I have spoken only of the *spade*, as a tool to be used in trenching; but in stony or gravelly ground, or in chalk, a *spud*, with three grains, such as they use in the hop-countries, would be necessary; and, in some cases, a *pick-axe*, for moving the bottom part; for, let it always be borne in mind, to move the ground deep and to turn it over are things absolutely necessary to successful planting.

26. There are cases, such as that of *low*, *marshy* or *wet*, grass ground, where it might answer very well to pare off the top in summer, and burn it, using the ashes in the above way. For, it might be difficult to *plough* in such land; and still more difficult to make the surface so clean as it ought to be, if it were advisable *to keep the top soil at top*, which, generally speaking, is the case, especially in land of this description.

27. If there be a *wet bottom*, where *rushes* grow, there must be draining; for, where rushes thrive, trees will not. The stagnant water must be removed by draining, or it is useless to plant trees. The oak, when it has got root, will

go down into the stiffest and sourest of clay; but it will not thrive, and will hardly live, if there be stagnant water at bottom. Open drains, or ditches, are not much inconvenience in woods, where no carriage need ever go, except at the time of cutting down.

28. Whether trees be placed in large plantations, or in *clumps*, or in *single rows*, or along by *water-sides*, the preparation of the ground ought to be the same; only, in the last two cases, there will be *holes* only to prepare, unless the trees be to stand near to each other, and then it will be best to trench a *strip* all along, about ten feet wide. If in holes, the hole ought to be not less than of ten feet diameter, if possible; for, to put a tree into a small hole is only putting it into a very large pot. I shall, further on, speak of preparing trees for *avenues*, which are certainly very beautiful things, and which, when they fail, generally fail from want of skill, or of care, in the planter.

29. Now, as to the *reasons* for trenching ground about to be planted with trees, the first is, that, whenever you move earth, there is a *fomentation* that takes place, and this fomentation causes a division of the ground into smaller particles, which, as Mr. Tull has clearly shown, is the great use of manure. By exposing earth, long buried from the sun and air, you make it more fit for the food of plants. When loose to a good depth, it absorbs the rains and dews more quickly, and retains them longer. It is a great mistake to suppose that plants want the ground moved *no deeper than their roots go*. If this were the case, plants (as I have elsewhere observed) with very short roots might be cultivated on a brick or stone pavement with earth laid upon it to the thickness of a foot; and yet, no plant will live and thrive in such a state; though it will do very well

along side of the pavement, though in ground moved only a foot deep. The solid ground, though it has lain unmoved for thousands of years, is not equal in hardness to a pavement: it is still porous in a certain degree: even chalk admits the rains and dews; and, where the bottom is stone, it has openings in it. But, the *unmoved* bottom, be it of what nature it may, is not so good as the moved bottom which has had the air let into it. Then comes *experience*, which universally proclaims the great benefit of deeply moving the ground. Even the market-gardeners, near London, when they are preparing for an extrordinarily valuable crop, give their ground what they call a *bastard-trenching*. This is done by taking off one spit from trench *a*, for instance, and wheeling it away to the point where the work is to end; then *digging* the bottom of trench *a*, as mentioned at the close of paragraph 18; then turning in upon that the top spit of trench *b*; then digging the bottom of trench *b*; then turning in upon that the top spit of trench *c*; and thus throughout the piece. This moves the ground about 18 inches deep, and keeps the top soil still at the top. It costs about *twice as much* as plain digging; and, we may be sure that it would not be done, if experience had not convinced these skilful men, that there was *gain* attending this *additional expense*. If, then, they do this for their cabbages and brocoli, ought a tree planter to hesitate upon the subject?

30. The *expense of trenching* must necessarily differ with the difference in the nature of the soil; but, on an average of soils, a man will trench *three rod in a day*; and, at the present price of provisions (bread 2*d*. a pound and bacon 9*d*.) a man ought to earn 2*s*. 6*d*. a day. This is, then, 10*d*. a rod, or 7*l*. 13*s*. 4*d*. an acre; or, reckoning to the utmost, suppose it to be 8*l*. Many a one

will exclaim: why, that is more than the land is worth if it were to be sold! And, what of that? The question is nothing at all about the worth of the land; but about *the profit* that you may make by planting it in a proper manner. The small worth of the land is rather an argument against you, unless you take it for granted, that your produce will not pay you; and, if you do that, it would be better not to plant at all. I shall, hereafter, show, that there is hardly any land that it will not answer to trench, and that, too, in the very best manner.

31. In order to have the trenching well and truly done, the best way is for the men to work *by the day*, and not *by the rod*. Reaping, mowing, hedging, ditching, and many other sorts of work, is, perhaps, best done by measure, or by tale, or by the job. But, when the thing is not *above board*, the temptation to slight the work is too strong. "Dead men tell no tales;" and a trench is a grave. The *colour* of the ground, and *poking a stick* down here and there, will tell a pretty good judge, whether justice have been done you. But, these are not effectual; and, at last, there come accusations on one side and protestations on the other, neither of which make the matter much better. The best way is to pay the men by the day, to pay them at a rate that will enable them to eat two pounds of bread and a pound of bacon a day, and to drink two quarts of beer 18 gallons to the bushel of malt. All these will now cost 1*s.* 5*d.* a day; and, if you give 2*s.* 6*d.* a day, the man will have 1*s.* 1*d.* left for other purposes, of which, whether he be married or single, there will be enough present themselves to him. It is useless to set a parcel of half-starved, reeling creatures at work like this. They cannot *move nimbly* in laying out the lifts and the trenches. You cannot call up a man to run and jump, when you see him hardly

able to drag his carcase along. And, how can you expect such a creature to lift a spit of earth, weighing from 8 to 12 pounds, about *six thousand times in a day!*

32. The best, and, in the end, the *cheapest* way is to employ men by the day; to have a really good and trusty man to *work with them* (example is better than scolding); to see them *begin well* yourself; to visit them often; to repeat, at *every visit* (for their memories are short), your orders as to the manner of doing the work, and to insist on their keeping steadily at work, for if men *keep on*, they will almost always do work enough. The straight back and the gossip are the great enemies of the progress of the labours of the field. But the great things of all (next after sufficient pay), are your *own presence* on, or near, the spot, and a conviction in the minds of the men, that *you understand the whole of the business well.* If you *could* just take the spade, or spud, and *show* them a little now-and-then; if you *could* do such a thing, it would be a great additional benefit; and I pledge my word to you, that it would do harm to neither your body nor your mind. The two first fingers of my right hand are still somewhat bent, from having been, more than forty years ago, so often in close embrace with the eye of the spade and the handle of the hoe; but I do not find that this bend makes them the less fit for the use to which they are at present applied. What think you of a short lesson in the garden every day before breakfast for a month, before your trenching begin? This would be attended with one signal and most important advantage; namely, it would, by the appetite it would give you, enable you to judge what portion of food ought to be allotted to the man who lifts six thousand heavy spits a day. And, as to the character of such an act, the Emperor of China holds the plough once a year; and, besides, why should it be more degrading

to you to be as skilful as your gardener, than it is to be as skilful in the infinitely lower business of your groom, or your dog-feeder? However, if this manual act be too much to expect, let me exhort you to let your workmen be thoroughly convinced that *you understand all the matter well.* Let me exhort you to give simple and positive *orders,* and never, no, never, to encourage, by your hesitation, even your bailiff or gardener so much as to *offer* you *advice.*

33. There is one part of this work which the owner ought always to attend to in person; namely, the laying of the ground out into *lifts.* If the lifts be long, *a line* cannot be stretched to the whole length at once. The sticking up of sticks (or poles if the ground be in hills and dells) must be resorted to. This, if set about in the right manner (of which I will speak when I come to *planting*), is the easiest thing in the world; and yet, if left to workmen, they, with their feet and hands and tongues, will, especially if the ground be of uneven surface, or very irregular form, trot and poke and muddle and bawl about, from day-light to dark, in doing that badly which a head and a pair of eyes would cause to be done well in an hour. You should look at your men, when they begin trenching, and pick out two of the nimblest and handiest, to measure out and mark the trenches for some distance on. You should interfere, and show, or at least tell, those men how to measure, how to move the line, and how to make the marks by the side of it. This would give them a high opinion of *your knowledge* of the matter; and this would save you all the disagreeable trouble of finding fault, and save you a great deal of money into the bargain. But, above all things, avoid asking their *advice,* and even telling them your *intentions.* If you do this, even with the foreman, they will all soon become *councillors.* They will deliberate ten times a day; and those

who deliberate know not any sense in the word *obedience*. As many hands as you like; but only *one head*, if you mean to avoid the mortification of seeing your object defeated.

OF FENCING THE GROUND.

34. In many instances there are fences already, and then you have only to keep these fences good, and, where hares and rabbits abound, to keep them out as completely as possible. But it frequently happens, that a piece of raw ground is to be planted; and then there must be a new and effectual fence made. Suppose it to be part of a tract, on which cattle and sheep are turned out. The fence must not only be effectual at first, but *durable*. In short, it must be a *live* fence. The fence itself is *a plantation*, then; and it is one which demands even greater care than any other; for, if it be insufficient, you plant the ground without even a chance of success. The *White-thorn* seldom grows well, or, at least, *quickly*, in light and poor ground, or in chalk; but, I know of no ground, in which it would not do well, and get up quickly, if well planted and well managed. The usual way, in cases such as that here supposed, is, to throw up *a bank* on the edge of the enclosed land. Thus the base of the bank is the *solid ground*. Upon this solid ground comes the *top* mould from the ditch. The top of the bank is composed of the earth from the bottom of the ditch, which is the very *worst* earth to be found on the spot; and in this earth, laid in a shape never to suck in a drop of wet, and to be dried and baked through and through, *the hedge of small quicks is planted*, and there left to carry on, single-handed, a contest against the combined forces of docks, thistles, and the coarsest kinds of grass. At the end of five or six years the mortified owner sees here and there a white-thorn alive; and he ought to bless his stars that he can see even these.

35. Now, in the first place, when the outsides of the ground are marked out, the ground where the bank is to be ought to be trenched, agreeably to the foregoing directions, keeping the old top soil still at top. Then the top soil of the ditch, five or six feet wide, ought to be laid upon this trenched ground, making a bank three feet wide at top, and level there, in order that it may hold some water when sunk a little in the middle. This will make a bank full two feet above the level of the ground, because the trenching under it will have raised the earth six inches at least. Then, in order to have the protection of a ditch, all the bottom of the ditch, to the depth of two and a half feet below the top soil, ought to be thrown out *on the other side*. This ditch itself would be nearly an effectual fence against cattle, sheep and pigs; at least, it would be such for a year or two, until a great mouldering down took place.

36. The bank being formed in this way, *quickset* (otherwise called *whitethorn*) plants, four or five years old, and *removed* previous to their last year's growth, each plant being as big at bottom as a man's (a *labouring* man's) forefinger, should be planted, any time between September and April; and cut down, at the time of planting, to within a foot of the ground. The manner of planting and of pruning the roots will be seen under another head. The plants should stand 15 inches asunder; they should be in one row, and that row about a foot from the outside edge of the top of the bank. The ground on the top of the bank should slope a little, from the outside edges to the stems of the plants, in order for them to receive the rains at their roots. Through the summer, the ground on each side of them should be *hoed* pretty deeply, and kept quite clean. These plants would, the first year, make long and strong shoots. The next spring cut them down to within an inch of the

ground. Go over them in June, and cut off all their shoots close to the stem, except the two strongest of each plant; and, the ground must be poor indeed, if these do not, during the summer, get to be *three feet high* at the least. Let them go on another year. These shoots will then be five feet high. Then, in winter, take one of the shoots of each plant, and *plash* it close to the bottom; that is to say, bend it down longwise the hedge, and give it a cut on the upper side about two inches from the stem; cut off the top of it so as to leave the remainder about a foot and a half long; bend it down to the ground, making it lie as close as possible to the stems of the neighbouring plant; and fasten it to the ground with *two pegs*. When you have done this all the way along, there will be one *plash* for every interval between the stems of the plants. You must, of course, lay the *plashes* with their points all one way. When this is done, cut down the upright shoots to within four inches of the bottom. The next October, that is to say, at the end of the *fourth summer*, you will have a complete, efficient and beautiful fence. It will want topping and side-pruning in order to keep it of uniform height, and to prevent the top and sides from injuring the bottom shoots, by *drip* and *shade*. It is, of course, understood, that the hedge has been kept quite clear of grass and weeds all these four summers.

37. Never was there a greater mistake than to suppose that you get a *cheap* hedge by using *low-priced* plants, or, that you get a *close* hedge by using *numerous* plants. As to the former, a yard of broad-cloth may be *cheap* at thirty shillings, while a yard of the fabric of the Cotton Lords may be *dear* at one single penny. Besides, so few plants in number, are wanted, according to my plan, that even the *first cost* may be *less* than that occasioned by the common

method of planting quickset hedges. I shall, under the word "*Hawthorn*," or "*Whitethorn*," treat of the manner of rearing the plants. Then, as to the other error; namely, the supposition that a *close* hedge is obtained by putting the plants *very near* to one another; who ever saw *any plants*, of any kind, thrive, if standing so close as to struggle for subsistence? Such struggle immediately begins, in a thickly set hedge. Some plants are stronger than others. The plants are much too young for you to ensure *uniformity* in their size and strength, which is a great thing, and ought in no plantation to be overlooked. The weaker plants are subdued. The growth is uneven. There are *low places*. Every person and thing, wishing to cross the hedge, is invited to these. *Gaps* come; and then the hedge is not worth a straw. In very good ground, this hardy plant will, even when thus mismanaged, *get up*; but, it will be feeble, have a big top and a hollow bottom. Whereas, by giving each plant 15 inches of space, you leave room for its roots to get food; by using *large* plants you secure uniformity of size, and, of growth. You quickly get stout stems; your shoots are strong; and you get an effectual fence in half the usual time. Suppose a hundred acres of land in a square form. The four sides will be, in length, 500 rods, or thereabouts. To plant these with quicksets, according to my plan, takes about 6,700 plants; and, I have many times seen more than at the rate of 20,000 plants to a like space. Then, they are so easily hoed and kept clean, when thinly planted; and (which is a thing by no means to be overlooked) a *hare*, which, in half a minute, snaps off four or five small *quicks* to make herself a convenient promenade, is under no temptation to molest the large plants, which present, besides, much too tough a job for her to perform by way of amusement; and, at last, when the plashes come to be laid down and to grow, all is

soon *too stout* for her to attack; and she must wriggle through as well as she can.

38. But, there must be a fence of some sort before the quick hedge become effectual. The kind must depend on local circumstances; but, be it what it may, the best way of securing the *bank* is to make it, if possible, in wettish weather; to make it *slop pretty much*, so as to prevent crumbling down; to hang it with bushes all over; to *peg those bushes well down;* and, at the time of making the bank, to sow it very thickly with the sweepings of a meadow-hay loft. These seeds, beaten in with the spade, will, in almost any sort of ground, make more or less of a turf in a short time. The bushes will keep off invaders; and thus the bank will become firm.

39. There are other sorts of plants fit for live hedges; but, though I shall speak of these by-and-by, the *White-thorn* is, and always must be, our great resource in this way.

OF THE TIMES OF THE YEAR, AND OF THE WEATHER, FOR PLANTING TREES.

40. We must here, as in many other cases, yield obedience to circumstances. If I could have my choice; if I could have, in this respect, just what I pleased, I would trench in *March*, and plant in *April*. But this, except upon a very small scale, can hardly ever be. It is always an advantage to put seeds and plants into *fresh-moved ground*. If of two cabbage plants, you put one into fresh-dug ground, and the other into ground that has been dug a considerable time, or only a week before, though the spots be within a yard of each other, you will (the plants being alike as to age,

size and condition) find the former take root and make progress several days sooner than the latter. The reason of this is, that, whenever the ground is moved, a fermentation takes place; all its energies are put in motion; and those energies operate on the plant. Seed, sown in fresh-moved ground, will *come up much quicker*, than if raked into ground in any degree stale.

41. However, knowing what is *best*, we must, in the case of extensive planting, content ourselves with coming as near to it as circumstances will permit us. A planter has not an army at his command: he must take the hands that the neighbourhood affords him, and must do his work when he can. But, the trenching ought to be done as near to the time of planting as circumstances will admit; and if you be compelled to trench at any considerable time beforehand, you ought to *dig* all the ground again when you plant.

42. If the weather be open and dry, you *may* plant at any time between September and April; and even to the end of April, if you take great care as to the manner of doing it. *Evergreens*, however, should go out early in the autumn or late in the spring; and there are some evergreens that are worth great attention.

43. Never plant in *wet* weather, nor when the *ground is wet*, if you can possibly avoid it. The ground never *ought* to be either moved, or walked upon, when it is wet at the top. But, we are frequently compelled to do both, or to leave our work wholly undone. It is a very great error to suppose, that plants take root quicker for being planted in wet weather. The contrary is the fact. One great thing is, to make the earth that goes close to the roots *fine*; and this

you cannot do in wet weather. For this reason it is, that I prefer March and April as the season for doing the work of planting: but, be it done at what season of the year it may, the ground ought *not to be wet;* for then it falls in about the roots in lumps, or in a sort of flakes, like mortar. It never gets close and compact about the roots; and if you tread it, it becomes, in dry weather, so hard as actually to pen up the roots of the tree as if they were in a vice.

44. It is a great error to suppose that you *gain time* by autumnal or winter planting. You do, indeed, see the buds come out a little more early in the spring; but it is the effect at the end, and not at the beginning of the summer, at which you ought to look. If you plant in the autumn, or winter, the plants get *blown about* for several months, and, in very wet weather, their stems work a sort of *hole* round themselves; and thus the root itself is shaken; and if left thus, they will, by March, be generally leaning on one side, with the hole open on the other side; and when the harsh winds of March come upon the long-time battered ground, it will present a surface nearly as hard as a road. In such a case, the ground ought to be dug or spudded up between the trees, in March or in April; for nothing can thrive well in ground thus baked, however good the ground may be in its nature.

45. If you plant in the spring, you obviate all these evils. The ground is dry; it receives no injury from trampling; it lies light, and is ready to suck in the warm rains; it is easily kept clean all the summer, and you do the work in half the time, and, of course, at half the expense. The buds come out a little later, as I said before; but they come out stronger. The roots have warm ground to go off in; they all strike at once, and do not die in part, as those of

autumn or winter planted trees frequently do; and if part of the roots of a tree die, the tree very rarely thrives.

46. There is, as to the seasons and weather, some differences, which arise from the difference in the sort of trees; but these, where they are of importance, will be mentioned in the proper place. One general rule, however, is, that trees should not be moved, and of course, not planted, in time of *frost*. Frost *dries* the roots; and, if they become very dry, they die. However, here also something depends on the *sort* of tree, and on the treatment at the time of planting; and, I ought to add, that I have *proved* by experience, that a little frost will not *kill* trees in their removal, whether they be large or small. In 1805, wishing to have a *high screen at once*, I bought, in a nursery at Brompton, some trees from twelve to twenty feet high, and carried them down to Botley. They were Limes, Planes, and Sycamores. They were put on an *open wagon*, not covered with any thing; I could not attend to the matter in person; they were treated as unceremoniously as any equal number of faggots ever were; it was in December; a sharp frost came on the first evening of the journey; the wagon stood out of doors all night at Farnham; it reached Botley the next night; it stood out all night again, the frost still remaining; next day the trees were put on the ground, and their roots were covered with straw: there the trees now are, from forty to fifty feet high, and some of them, I imagine, nearly as big round as my body. This is, however, very adventurous work, and what no one ought to think of imitating. These trees were planted against *a wall*, in a very *sheltered* situation; the ground, which was good and moist in its nature, had been trenched four feet deep, and had been well manured from top to bottom; I pruned the roots with the greatest care; *soaked* them in water twelve

hours; *sifted* the mould into the holes about the roots; pressed the mould about the roots with men's *hands;* and, finally, covered the top of the ground over with short litter from the stable, which I kept there throughout the winter, and laid on a fresh bed of it for the summer. With all these pains, these trees are now just about the height of some *ash,* standing very near them, the *seed* of which *I* saved that very year! If I had planted trees two feet high, they would have hidden the wall sooner and more effectually, and would have been ten feet higher.

47. In 1824, I took up many thousands of Locusts, on the 15th of March, in a field at Worth, in Sussex; they were going into Wiltshire in a wagon; the wagon (coming for them) was stopped on the way by *snow;* the trees were taken up on a dry frosty day; they were tied up in bundles, with withes, like faggots; some fern was put into the bottom of the wagon; nothing was put round the roots of the trees; they made a large and high load, just like a load of faggots; the wagon was three days and nights on the journey back; part of the trees were taken out, on the road, and left to be taken into Berkshire: I understand that they have *all* thriven exceedingly, and make very fine plantations. But, while I relate these things, I by no means *recommend* this hazardous work; for, though trees may be able to *stand* it, when *great care* is taken about the planting, and when the ground is *very good,* such treatment might nearly kill them, under different circumstances.

Of the age and size of the plants, and of preparing their roots for planting.

48. Though I have, in paragraph 46, given an account of what may fairly enough be called *successful* planting of

old and large trees, no man in his sober senses would think of doing such a thing upon a *large scale*, and especially for *profit*. People who are in *haste* to get trees round, or near, a house, or round a domestic enclosure, plant large trees for the purpose; but, if they happen to plant small ones at the same time, they soon discover that the large ones are of no use. There is a very happy illustration of this, on the side of the great western road, on the left, going up the hill from Virginia Water towards Bagshot, in a plantation, made about twelve years ago. The ground was, I think, trenched, but, in all probability, *not keeping the top soil at top*, though the nature of the ground demanded it. There was a promiscuous mixture of firs and deciduous trees of a proper enough age and size; and, though the latter have never been cut down and otherwise properly managed, these young trees make, all together, a *show* of wood; they hide a six-feet paling from within, and you see some of their tops over it from without. But, at the same time that the young trees were planted, there were planted along the middle of the strip, or belt, a row of *large trees*. They were about ten or twelve feet high, when the plantation was made, and there might be about a hundred of them in all. They were evidently intended to be a magnificent row of trees, to be seen from the mansion, which is about half a mile back. Alas! they have, according to the vulgar saying, "grown like a cow's tail": they have literally grown downwards, till there is, I think, only *two* of them *to be seen*. The ground is of the *eleventh sort*, mentioned in paragraph 9. Very poor; it lies high; the spot is bleak. When the trees were planted, they were propped up by, and tied to, stakes. The wind and wet soon destroyed these protectors. The trees, in great part, died outright; and the whole of those that did not die, do not now make, all put together, a mass of wood, twigs and leaves, equal to that which is

contained in *one single locust tree* (three or four feet high at the same time of planting), growing on the side of the porter's lodge on the very same spot.

49. If this gentleman had planted all young trees; if he had had all the deciduous trees of the same sort, age, and size; if he had cut them down and pruned them as hereafter to be mentioned, he would now, notwithstanding the poorness of the ground, have had a plantation twenty feet high and of uniform height; and he would not have had the mortification to see his row of large trees disappear one at a time, and serving no other purpose (not, indeed, an unuseful one,) than that of teaching him not to expend his money in the like way again.

50. Well; but why, then, do *nurserymen*, who must understand this matter so well, keep such large trees in their nurseries? Simply because they know, from experience, that there are people who will *buy* them; and it is their business not to make plantations flourish, but to *sell trees*. You never find one of them to *recommend* large trees; I mean no one of any reputation. If they do sin a little too much in this way, it is in the article of *fruit trees;* and they are not so much to blame even here; for people *will* have the large trees: they will *stick up* an orchard at once: they will not believe, that a little young twig of a tree will bring them, at the end of seven years, forty times as many apples as a tree which has already got a stem as big as their wrist, and a fine branching head. They *will not believe this;* and, therefore, the nurserymen are not to blame.

51. The *reason* why large trees ought not to be planted is, that, at the end of five or six years, they, if they *succeed*,

are not so large as those which are planted when two or three feet high. This reason is quite enough. There needs no other; and the fact may be proved by thousands of instances. But, if any additional reason were wanting, there is the *shape* of the tree, and its *ultimate size*. When trees are planted large, they are usually naked at bottom. They have stood crowded in the nursery, and have no branches, except near the top. In short, they are *top-heavy* things, with trunk and root disproportioned to their height; and, to plant them is to provide yourself, at great expense, with a lasting store of mortification.

52. The cause why large trees suffer so much from being moved, and that small ones do not, is, that, in the former case, the roots, in proportion to the size of the tree, become so much more curtailed, than they do in the latter case. When a tree is moved, it must, however small it may be, *lose a considerable part of its roots;* and, observe, there is not one particle more of root than is demanded by the stem and the branches. A tree which is from 2 to 4 feet high will have roots, if traced to their utmost extent, 4 or 5 feet long. How long, then, must those be of a tree which is from 10 to 12 or 14 feet high! And what a violence is committed in the removal of such a tree! If you could, in any case, take up a tree with every one of its roots unbroken, and to its utmost fibre, you must *shorten* the roots; for, who could make a place to plant a tree with roots five, six, or twelve feet long? Besides, the small hairy fibres die, upon the tree being moved: they never strike again. So that here is, in spite of all the pains that you can take, a great suspension of supply to the stem of the tree. In short, you are obliged to cut off the roots to a certain extent, and to take away all the fibres. The roots of a small tree may (as we shall see under the next head)

be left from 2 to 6 inches long; and you cannot very well leave those of a twelve feet tree more than two feet long, though, perhaps, they reached fourteen feet in the ground. It is manifestly impossible, that, with such a remnant of root, the trunk and branches can be sufficiently supplied.

53. In consequence of this want of supply to the trunk and branches, the tree remains in a sort of stagnant state. The bark, for want of a sufficient flowing up of sap, becomes *clung* to the wood, which gardeners call being *hide bound*. Buds may come out the first summer, in all the branches; but these buds are *weak;* they do not become shoots; the leaves are all smaller than they ought to be, and do not properly perform their functions; they are not of the right colour; all has a sickly appearance; and a look at the tree in summer, tells you what you have to expect the next year. The spring discovers to you a part of the smaller branches dead at their tops, some of them dead altogether; you cut these out to get rid of the eye-sore; and thus a part of your tree has disappeared; it already bears no resemblance to that beautiful and gay and flourishing thing that it was, when you fell in love with it in the nurseryman's ground; and you are much about in the state of feeling of the love-sick girl, in Mr. Monk Lewis's pretty song, when she saw her "gallant and jolly tar" come home to her longing arms, with "the loss of a leg and an arm and an eye." It is, it must be confessed, pretty tough constancy, that can hold its own after the roses and lilies and dimples have had a good digging, or ploughing, of the small-pox, which has, by way of doing the work well, closed up one eye, or turned it inside out. Yet (to the honour of human nature I say it), I can even believe in the possibility of sentiment as sublime as this, when I behold the fond planter of large trees retaining all his affection

for them, while they are yearly diminishing in size and increasing in ugliness.

54. You may move some sorts of trees, with a chance of success, when at a greater age and size, than you can, with such chance, move others; and there may be, now and then, a case, where it is necessary to plant large trees. When this is done, the greatest possible care should be taken not to *bruise* any part of the roots that are to remain. When a tree ten feet high is taken up, you ought to begin by digging out the earth pretty deeply, at six or seven feet from it; and, as you approach the stem, to take special care not to *tear* or *bruise* the roots. The whole of the roots, as far as you have been able to get them out of the ground, should be kept on till you get the tree to the spot where it is to stand. Then, the hole being ready, you should, with a knife, kept constantly sharp, prune the roots, first taking out quite clean all the hairy fibres: then you shorten the *main* roots to about two feet long (if the tree be twelve or fourteen feet high); then shorten the side roots that come out of these, to four or six inches. Cut with a *very sharp* knife. It will, however good it may be, soon grow dull when employed on roots. But you must cut smooth, and not *tear*, and not leave, at your cut, any bark of the root uncut off, any more than you would leave the bark uncut off when you prune a shoot or a branch above ground; for, if you do not cut clean, the amputated root, like an amputated branch, becomes diseased, and thus injures the tree. The roots of such large trees should be kept out of ground as short a time as possible; and by no means be exposed to the sun, or air, one moment longer than is absolutely necessary. If, by any accident, they should become *dry*, they should be laid in pond or rain water 10 or 12 hours before the operation of planting takes place. This softens

the bark of the roots, and restores it to something like the state in which it was when in the ground, before the tree was moved. I shall, by-and-by, speak about the *planting* of small trees; but, as I do not wish to return to these large trees again, I will here add, that, before you put the tree in the ground, it is a good way to dip the roots in *mud* (natural or made), which will cling round the bark; for one of the most essential things is, to make the earth *touch closely* every part of the bark of the roots, which it does not do, unless you take very great pains, first to make it *fine*, and next to *press* it closely, as you put it in. You should, as you are putting in the earth, lift the tree a little, and jog it up and down, that the earth may go into all the cavities, and closely touch the root in every part. Then, when all the roots are thus covered and surrounded with the earth, you may fill in the top with the spade, and tread it a little, beginning to tread at the outside of the hole, and ending at the stem of the tree. It is quite useless to tread at the top, unless you first take care of the bottom. Even with all these pains, a large tree will, at the end of five or six years, be overtaken by a small one; but without these pains, the large one will, nine times out of ten, produce nothing but mortification.

55. In the case of *plantations* of any extent, no man, however, thinks of large trees; and now I am to speak of the age and size, and of the pruning of the roots of the smaller ones; but, there is one particular case, in which, even if upon a large scale, it is absolutely necessary to plant large trees; that is to say, if you plant any at all. I allude to unenclosed lands, where the *herbage* belong to many persons, and where the timber and the right to plant trees belong to one; and this is an important matter, too, because it relates chiefly to the rearing of *oaks*.

56. In such cases, the trees are, according to a fashion long in use, taken up when from twelve to eighteen feet high, and when as big round at the bottom as the wrist of a man six feet high. I am, at present, speaking of *oaks* only. The planter selects straight young oaks, which have come up from seed, in the woods, where they stand *too thick:* and here is a fatal error to begin with. This excess of plants would be a very good reason for cutting the superfluous trees down, and making poles, stakes, or even faggots with them; but, the very worst reason in the world for choosing them as plants. If you mean for any plants, even those of the cabbage, to be fit for transplanting, never let them *stand thick* in the seed-bed, or on any spot to which you have removed them from the seed-bed. The grounds of this precept are known to every man and every woman, who has a garden and a porridge-pot. By remaining in this crowded state, all plants, of every description, become weak in the stem, or stalk, and top-heavy. They are said to *draw each other up;* that is to say, they must, if they grow at all, push upwards. While standing thus crowded, they hold one another up; but, if you thin them very much, all at once, those that remain will lop, and indeed, their heads will, when the leaves are on, frequently bend down nearly to the ground; proofs enough of which you will see in any oak wood, which has underwood beneath, and in which young oaks have been left, after the underwood (ten or twelve years old) has been cut down. The young oaks grow up like the shoots of the underwood: it is right that the underwood should be crowded: it is not to produce *plank* and *beams:* it is to produce poles and stakes and broom and hoe-handles and hoops and rods.

57. Besides this *drawing* up, and its consequent weakness, there is the *cold* to be guarded against. The oak

is, as a vegetable, a tender thing. The frost affects it, when it affects hardly any other forest-tree. Its spring-shoots are frequently killed by the frost, when the Ash, the Beech, the Elm, and other trees, remain wholly unaffected by it. But the effect of cold upon oaks must be obvious to every man who has seen a *thick* oak wood cut down, leaving, here and there, a tree which has been thought too small for cutting. These trees never thrive more. They stand "*stunted*," as the woodmen very properly call it. They do not actually die; but they never thrive more. What, then, must be the inevitable effect of such a change of climate as that which is experienced by the young oak which is taken out of a coppice to be planted in an open common? A coppice is *always* warm. In the coldest days that we know, when hail and sleet cut your face, and when you are really pinched with the cold, go into a coppice, and you are warm. In the very hardest frosts, the *ground* is seldom frozen in, or near, the middle of a large and well-set coppice of six year's growth, or upwards. Even in that bleak and terribly cold country, New Brunswick, where the frost comes about the 7th of November, freezes the river St. John (a mile across) over in one night, so that men walk across in the morning; where, in the open lands, the frost goes four feet down into the solid ground; even in that country, if you, in the very coldest weather, when, in the open air, you dare not venture *ten yards* without protecting your hands and face with fur; even there and then, if you go half a mile into the woods, you are in a mild and pleasant climate. I have, scores of times, gone to the edge of the woods, wrapped up in flannels and blankets and furs, and, when I got in, reduced my dress very nearly to an English one, and set to squirrel-hunting, even with my gloves off.

58. Trees have their feelings too; and, what must inevitably be the consequence of taking a young oak from a warm coppice, and planting it on a naked common? Plantations in these situations are useful, ornamental, and, therefore, highly praiseworthy. But, then, the trees should be *raised for the purpose;* raised and managed with a view to their destination. The acorns should be sown (as hereafter directed), the young trees should be moved twice at least; and they should, at the last removal, be placed at a good distance from each other; and kept pruned up to a single stem to the height of eight or ten feet, that being necessary in this sort of planting, where the boughs must be out of the reach even of a house.

59. The mode of planting is this: the *turf* is taken from the surface of a circle about six feet over, and it ought to be eight, at least. The turf is laid on one side for the present. Then a hole is trenched, three or four feet deep; and here the top mould ought to be kept at the top. Then the tree, with its roots ready pruned, is planted, leaving the bottom of the stem a foot above the level of this trenched ground. Then you begin to build, with the turf, a *bank* round the hole. Then you take off the turf about fifteen inches wide round the outside of the bank. Then dig up the mould that lies under this turf, and put it into the sort of bowl that you are forming with your turf. This will, together with the turf just taken off, fill the earth up round the stem of the tree to six or eight inches or a foot (according to the height of the tree) *higher than the bottom of that stem;* that is to say, the tree will stand *so much deeper in the ground than it stood before.* This last is contrary to all ordinary rules; but we are here speaking of no ordinary case. This is not merely *planting* trees, but *fencing* them at the same time and by the same act. Wooden guards round

the trees is out of the question. The cost would be a great deal more than the plantation could ever bring. In two years they *must* boil the pot, or bake the bread of somebody: the temptation would be absolutely irresistible. And yet, the trees must be protected from the croppings and the rubbings of cattle, sheep and pigs. This is pretty effectually done by a mound of eight feet base and three feet top, and three feet in height; which soon gets covered with grass; on which cattle *cannot* stand; upon which sheep and pigs *will* not get, because they see nothing to be gained by it; and, if, tempted by the grass, they do jump up, the situation is too cramped for them to remain there for any other purpose than that of eating the grass, which will, in all probability, have been eaten for them by the larger cattle; for they, standing on the level ground, can do this with (as the newspaper fellows say of the loan-jobbers) "great advantage to themselves and to the public also."

60. But, this planting should be done well. The earth, as far as it touches the roots, should be made very *fine;* and it should be placed about the roots, in the manner which I have minutely described in paragraph 54. There is no difficulty in taking a cinder-sieve to the spot. To sift the earth in about the roots, till they be all covered closely, is attended with very little cost; and, if a water-butt were necessary to the obtaining of mud, or grout, to dip the roots in, previously to planting, that would not cost much. And, I beg the planter, I do implore him, to bear in mind, that only *sixpence*, or even *threepence*, a tree, additional expense, may make *years* of difference, nay, much more than *half* difference, in the growth of the plantation.

61. For want of the precautions here mentioned, the planter, at the end of two or three years, sees the heads of

his trees about half the size that they were of when planted; he sees many of them dead; and, at the very best, he sees them with dead branches, dead stumps, and with the means of producing rottenness of trunk already prepared. Now, a great deal of this loss and this great mortification would be obviated by the additional expense of sixpence a tree at the time of planting. I have shown before, in paragraph 56, the cause of the general failure of large trees, and of their necessary slowness of growth, take what pains you will, and however favourable your soil and situation. But here is a case of necessity: you must, in this case, have large trees, or no trees at all; and it is desirable to have the trees; they are an ornament, an useful shade, a great beauty, and a great benefit, private and public, and the planting of them are amongst the noblest acts of noble-minded men.

62. The great difficulty is, to obtain, at first, for the trunk and branches, a sufficient supply of sap from *a root so greatly diminished*. You cannot do this in any case; not even in that of the youngest trees, no, nor even in a cabbage or a Swedish turnip plant. All the outside leaves of these latter die, in a few days, and new ones, fed by the new roots, supply their place. So that, in the case of a *large tree*, you ought to be content if it barely *live* the first year out, take whatever pains you may. I am, when speaking, which I shall do very minutely, of planting and managing young trees, to speak of *cutting them down*, after planting. But, as I, as I observed before, wish not to return to large trees again, I shall observe here, that the large trees, thus planted, might be cut off, near their tops, at the time of planting. When large apple trees are transplanted from the nurseries into orchards or gardens, their branches, of which they usually have several, are always cut off to within six or eight inches of the stem. The gardeners know well that they

must do this, or that the trees will never throw out fresh and growing shoots. And if this be the case with *all* fruit trees, why not with forest trees? The head is left unpruned, in the latter case, only because the timber-grower is not so anxious about success as the fruit-grower; and this arises from the period of expected profit being nearer at hand in the latter, than it is in the former.

63. I have stated, that the objections to autumnal and winter planting, are, that the winds blow the trees about before they can take root, and that the rains batter the ground down, and make it, before summer, as hard as a road. Now, these objections do not apply in this case; for the wind can have no power on a stout and well-fixed stem, which has no branches of any length, and rains can do no harm here, where the surface of the mound is never to be moved again. In this case, therefore, autumnal planting is best; because the banks of the mounds get solid before the dry weather comes on. You will have more difficulty in getting fine earth about the roots; but that forms so small a part of the work, when the trees are comparatively so few in number, that it is hardly worth mentioning, when opposed to the other weighty considerations.

64. Though I have spoken of *Oaks* only being planted in this way, trees of any sort may, and almost any sort with a better chance of success as to the *growth*. Ash and Beech, in particular, and especially when the bottom soil is of *chalk;* and *Elm*, when it is of gravel or sand or sand-stone. If of stiff clay, Oak will do best. Such a plantation *does not diminish the quantity of the herbage.* As much of it, if not more, will grow on the sides and on the top of the mound, as grew before on the spot where the tree has been planted. And, would it not be better for the Parliament to pass an

act to compel the BISHOP OF WINCHESTER, for instance, to plant a certain number of Oak Trees, in this manner, on the spot called Waltham Chase, than to permit him and his copyhold tenants to enclose this forest, to appropriate the lands, and to prevent the spot from being a forest for ever? During the last session of Parliament, an Act actually passed the House of Commons, to warrant this latter proceeding, which would have been one of the most odious things ever done in this world. To show what land this is for the growing of Oak Timber, I need only mention, that, a little more than twenty years ago, the late Bishop, exercising a right given him by a very old Act of Parliament, enclosed about twenty acres of the land, for the purpose of keeping out the common cattle, and thereby encouraging the growth of timber. I remember when these enclosures were made. The law allows them to remain enclosures for only twenty years; and about four years ago they were thrown open. I saw the enclosures made: the ground was bare, except that it had, here and there, a few bushes or bunches of heath upon it. I saw the spot in the fall of the year 1826, and it was covered with fine young Oak Trees, some of them more than twenty feet high, and many of them with trunks more than two feet round at the base. This spot is within about sixteen miles of the Dock-yard at Portsmouth. A turnpike-road goes through the forest to the edge of the harbour at Portsmouth; and yet the House of Commons actually passed a law to allow the BISHOP OF WINCHESTER and his copyhold tenants, totally to destroy this forest. The timber of this forest is the *property of the See of Winchester;* so that the Bishop (who is since dead) would have stripped the See of this source of riches for ever; for he would have cut down all the timber, young as well as old, now standing in the forest; the crown would have had this part of the things in its gift alienated from it

for ever; and, into the bargain, more than a thousand poor people would have been driven from the skirts of the forest, to seek shelter in the filthy outskirts of towns and villages. I counted, as I came over the flat of the forest, five hundred and seventy-two horses, cows, heifers, and pigs, every one of which was, I dare say, the property of some cottager. The ruin would have been of a character and extent most dreadful. I dare say that more than a thousand geese are reared upon the land of this forest: all this was to have been swept away; this most fertile garden for Oak Timber was to have been destroyed; saplings as well as timber trees were to be felled; and the Crown was to have a precious part of its rights alienated for ever; and all this to gratify the greedy desires of a set of stupid men, who could not see with patience the poor have the benefit of even these blades of grass; and who conceived the brilliant idea of growing immense crops of corn upon a bed of sheer clay, in which Oak trees thrive most admirably, but which will not bear one bushel of wheat, until, in some shape or another, it has first swallowed up the value of two bushels. To the great honour of the House of Lords, they threw out the Bill, for which they deserved the thanks of every man of sense, and they have already received the blessings of the numerous cottagers, whom their justice and wisdom saved from utter ruin.

65. After this digression, for which, I trust, no great apology will be required, I return to the subject of paragraph 55, to which the reader will, for a moment, have the goodness to turn back; I there was beginning to give instructions, relative to *the age and size, and to the pruning of the roots, of smaller trees.* The age and the size may be different in different sorts of trees; and, as this matter will be spoken of under the head of each

tree respectively, I have here to offer none but general observations.

66. The trees should be as young, generally speaking, as the nature of them will permit. In some cases, and, indeed, in most cases, they should be trees that have been once removed; that is to say, that have been first raised in a seed bed; and then put into a nursery, or plantation, in rows pretty close together, where they may stand for one, two, or three years, according to the nature of the plant, and according to its quickness or slowness in point of growth. The method of performing this work, is as follows: dig up the seedling trees in the month of November, or even in October, and, having tipped their roots with a sharp knife, plant them in rows about a foot or fifteen inches apart, and fasten them well in the ground. Some trees may stand closer to each other than others, in the row; but, in general, the distance of six inches, from tree to tree, may be enough. In this nursery, they will get new roots, which will come out side-ways, and will form what is called a bushy or shaggy root, and, in most cases, they will grow with greater certainty, and make greater progress in plantations, than when planted out at once from the seed-bed, the exceptions to which rule, will be mentioned under the heads of the several trees.

67. Almost every seedling tree, of great height, has a tap root, and, some trees, of very great length. I have seen a Hickory seedling, the plant itself not being more than six inches long, and the root more than *four* feet. Several trees make a tap root of two feet long the first year. These tap roots cannot be preserved in transplanting; and, if they were put into the ground, at full length, with an iron bar, they would be sure to die all the way

nearly up to the top. These tap roots must, therefore, be cut off to within three or four or five inches of the plant; and then the part that is left, will throw out side roots; and the tree will remove well into plantations. All trees, however, have not such tap roots; the Tulip tree, for instance, and trees of low stature, very seldom have them. Some trees, as will hereafter be mentioned, may go at once out of the seed bed into plantations, and this is particularly the case with the *Locust Tree*, which has a fleshy root, and takes readily when transplanted.

68. I have now to speak of the manner of taking trees up in the nursery for planting out; of packing them for conveyance from one place to another, of keeping them waiting for the act of planting; and of pruning their roots previous to planting. As to the first of these, the trees should be taken up with great care; the earth should be dug away deeply on the sides of them; and they should be taken out of the ground with their roots as whole as possible, and with very little or no *pulling;* for, though a considerable part of the lower ends of the roots must be cut off, no part of them ought to be torn, for the tearing may extend nearly up to the plant; and the consequences of a broken or torn root, are precisely similar to those of a broken or torn branch. A rotting takes place to some extent at least, and the tree will, in consequence of such rotting, not thrive nearly so well.

69. If trees be to be sent from one place to another, they ought, if the distance be such as to make it necessary for them to be several days out of the ground, to be packed up in the following manner. First, lay a mat or cloth upon the ground; lay some straw upon that, to the thickness of four or five inches; then lay upon the straw as

many of the trees, as the mat will conveniently contain; then cover the trees with a similar thickness of straw, taking more care about the root than about the stem; and then draw the sides and the ends of the mat over, bringing every part together with a very strong hand, and sew the package up, with twine or some other thing sufficiently strong. They should not be put together in this way, especially for a long journey, if they be *wet*. They should not be dry; but have merely the moisture which they would have, if taken out of the ground in dry weather; that is to say, weather dry over head; for really dry weather is not to be expected at such season of the year.

70. If a considerable plantation be about to be made, and especially if the trees be to be sorted in point of size, it would be necessary to take up the whole, before you begin to plant. As fast as they are taken up and sorted, they should, if the plantation is to take place near the spot where the trees have been growing in the nursery, be what is called *laid by the heels;* that is to say, a small trench is made of the length required, or of a certain length according to the shape of the ground where the work is to be found, which trench is made in this manner. You dig out a spit or couple of spits with a spade, and lay the earth upon the undigged ground before you. Then, smooth this little bank, and smooth also the rough ground, at the bottom of the trench. When this is done, lay the trees along this little bank, not too thickly, for, if laid in a heap, the roots will *mould*, and if they mould, they are in great danger of never growing afterwards. If they be roots of a fleshy rooted tree, they will, if heaped much together, rot in a short space of time. They may touch one another, and even lie two or three deep; but, if the earth do not *touch the whole of the roots*, they are very apt to contract mould,

if the ground be wet. When you have laid the trees along this little bank, you cover the roots by digging another spit or two of ground, and thereby making a second little bank, for another parcel of the trees, to be laid along in the same manner. A third little bank is made in the same way; and thus you go on until you have got the whole of your plants laid by the heels, in which state they will remain in perfect safety, if it should be necessary, from the month of October until the month of April. There are many advantages attending this mode of proceeding: you can sort your trees before you begin to plant; you can count them; you can lay them in by tens, by hundreds, or by thousands; you see what you have got; they are always ready, when you are ready for the work of planting: whereas, if you leave them in the nursery till the very moment you want them to plant out into plantations, you have two great works to do at one and the same time; you do not know what number you have; and there are all sorts of uncertainties and delays.

71. The next thing is to give directions for the pruning of the roots; and, as this is a work absolutely necessary to be performed, and of very great importance, I shall endeavour to make my instructions on this head as plain as possible. I spoke before, in paragraph 54, about pruning the roots of some trees, and observed, that roots are distinguished, some by the name of roots, and others by the name of fibres. The fibres of *trees*, when once taken out of the ground, never grow again, but the tree, if planted with the fibres left on the roots, very often receives great injury from the moulding of the fibres. The fibres, therefore, should be all taken out clean with a sharp knife. This is a work of great trouble, and may be dispensed with in Forest trees in general, but it were *better* if it were performed as to all trees. The roots are more substantial

things; and when the tree begins to grow again, new roots come out of those which you leave when you transplant it. On the following page, I have given a Drawing of a young Apple Tree, having two shoots, and about to be planted again, after having been taken up. Fig. 1. represents the tree with all its roots and fibres, just as it came out of the ground. Fig. 2. represents the tree with its roots shortened. You will perceive, that there are no little hairy fibres left, and that the roots are shortened in proportion to their size. The growth will begin by new roots starting out of these shortened ones; and these new roots will send out fresh fibres. This tree is pruned above, as well as below, but of that I shall speak more by and by.

72. Great care must be taken not to tear or bruise the parts of the roots which are left; and they must always be cut with a knife that is very sharp, and that leaves nothing like a tear or any thing rough in the bark of the root, at the point where you cut it off. It is a good way, and a very good way, to prune the roots of all your trees, before you lay them by the heels; because, they are then ready at any moment, when your plantation ground may be fit, and when the weather may serve for the work of planting. The danger is also less of mould; because it is the fibres that mould most, by intercepting the earth, and preventing it from touching every part. This work of root-pruning may, too, be done under cover, in wet weather, which will get every thing forward against the fine weather come; for the act of planting does not require more time, and not more care, than the act of pruning the roots.

73. If the tree, in the Plate just mentioned, were to be planted with all its roots and fibres, just as it came out of the ground, the fibres would all die, a great part of the

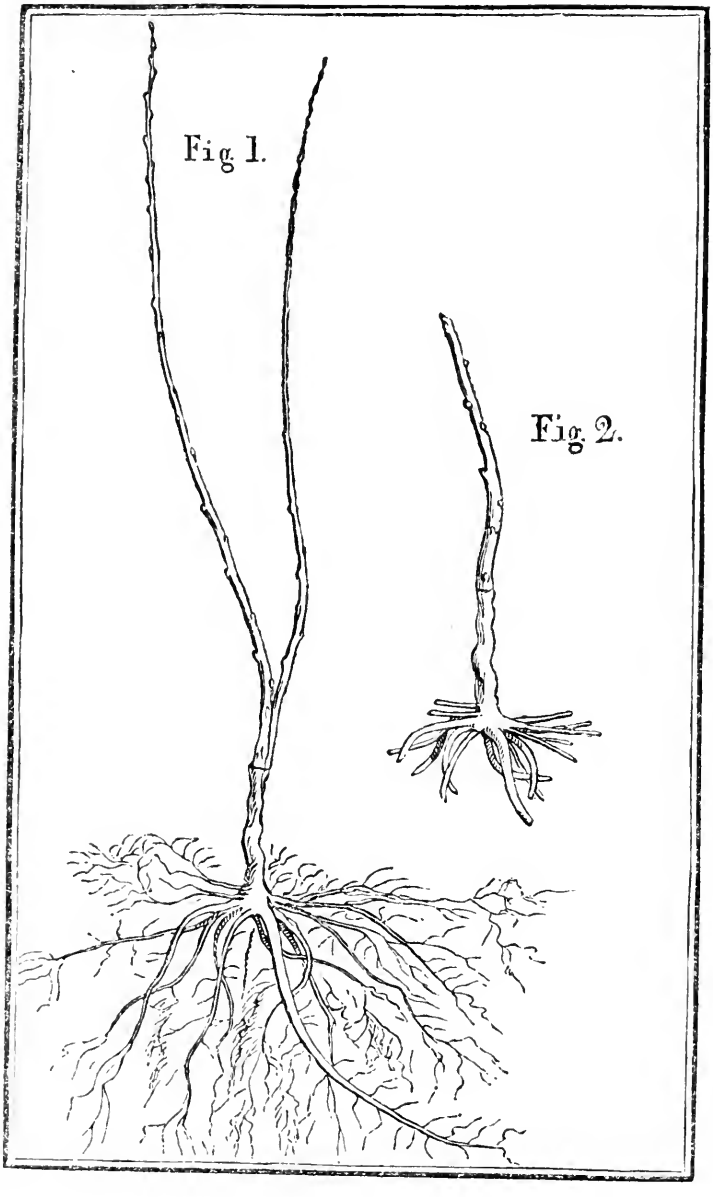


Fig 1.
Fig 2.

roots would die; and if the tree itself did not die, it would certainly never thrive. You ought to cut off no root quite close to the stem; but leave it to a length proportioned to its size, a specimen of which is pretty accurately given in the Plate. Once more let me impress upon the reader, the necessity of using a knife perfectly sharp, which is more difficult to be provided for in the case of roots, than in the case of branches or twigs. The root is a soft and sort of woolly substance compared to the wood of the tree; and if the knife be not sharp, it will leave part of the bark of the root in shape of a sort of ragged fringe coming out beyond the cut. This ragged bark is sure to rot, and it communicates rottenness, very frequently, to a great part of the root, and with a rotten root a tree will not thrive well.

74. As to the pruning of the *heads* of the trees, I shall speak of that in my observations that will come under the alphabetical head; and, now, having got the young trees ready for planting, all that remains to be done, under this head of General Instructions, is to speak of the manner of performing the work of planting. I have already spoken of the sorts of ground in which to plant Timber Trees and Underwood; of the method of preparing the ground for planting, and of the expense; of fencing the ground; of the times of the year, and of the weather for planting; of the age and size of the plants, and of preparing the roots for planting. All that remains, therefore, is, to speak, under this General Head, of the act or work of planting, and of the *cultivation after planting*.

OF THE METHOD OF PERFORMING THE WORK OF PLANTING.

75. It was before observed that the roots should be exposed to the open air, especially in dry cold weather, or dry hot weather, but for as short a time as possible. Therefore, when you take them to the ground, where they are to be planted, they should be kept covered over with mats or cloths, or straw, or something that will keep their roots from the wind and sun. Of the *distances* at which trees ought to be planted, I shall speak under the names of the trees respectively; but all trees must have their roots put into the ground; and, to do this WELL, there is but one manner. I have before spoken, a little, of the proper weather for planting; and have said, that it is a great mistake to suppose that wet weather is the best. I have shewn, in my YEAR'S RESIDENCE IN AMERICA, that dry weather is the best for the transplanting even of turnips and cabbages. It is the same with regard to trees, and the reasons will become manifest in a moment. In dry weather; that is to say, when the ground is not soaked with wet, the earth is fine, or may be broken into that state; and the most important thing of all is that the earth should *touch closely* to every part of the roots of the new-planted tree; and this it cannot do, if it be in lumps, or if it be wet. There will be, in such cases, hollow places amongst the roots; and a root will mould and finally rot if not *touched closely* by the earth. Mice and other vermin will also get into the cavities; and I have known a considerable part of a young orchard destroyed by such means. Therefore, the best weather is that which will enable you to put fine earth in about the roots. Let us suppose a little tree, like that which is represented in the plate, ready pruned for planting. The reader must

perceive, that the earth must be very fine to go in between the roots, the spaces between some of which are very small. To throw into the hole rough lumpy earth upon the roots of such a tree is not only not to do it justice, but it is to obtain almost an assurance of its failure.

76. Therefore, when you have made your hole, which ought always to be twice as wide in every direction as the extreme width of the mass of roots, one man ought to hold the tree erect in the hole, the bottom ground of which ought to be well and finely broken with a spade, while another man ought to break the ground just taken out of the hole, so as to make it very fine, and to let it fall from his spade in that fine state down upon the roots, while the other man ought to keep shaking the tree up and down, that the fine earth may run into and fill up all the cavities. When the hole is pretty nearly filled in this way, the earth should be pressed gently with the foot, beginning, not close to the stem of the tree, but round the outside of the hole, and the pressure should be less and less violent as you approach the stem of the tree. When this is done, the tree is safely planted; and you may then fill up the hole with the remainder of the earth, which was taken out of it, forming, at the close, a sort of little *dish* a foot or fifteen inches in diameter round about the tree, making the earth fine at the top of this dish, and taking particular pains to make the earth smooth, and to make it very close and compact round the stem of the tree. Then, the wet weather cannot come too soon; but, if it should not come for months, even in March, April and May, the tree is safe: the air, dry and piercing as it may be, and the sun, scorching as it may happen to be, will do no injury to roots protected by *finely* broken earth, which leaves no hollows for it to find its way through. Mr. Tull proved, by numerous

experiments, that the way to keep ground moist was to make it *fine;* and Mr. Curwen proved, that, in the same field, there was dew where he had made the earth *fine*, and no dew where he had not done it.

77. In paragraph 54, I spoke of the manner of planting large trees, and recommended the dipping of the roots, especially if in dry weather, in mud, either natural or made, just before planting. I have always planted in April, if I could; but sometimes in May; because I prefer the dry and fine earth to all other things. But, in really hot weather, such as we sometimes have in those months, I have what they call *grouted* the trees, which word grouted comes from the word grout, and that, certainly, from the Saxon word *grut*, which means wet dirt. The grout is made by taking some water to the plantation ground, putting it into a large tub, flinging some earth into the tub, and stirring it up till it form a sort of thick mud. The roots of the trees are dipped into this just before they are planted. A little of the mud adheres to them; but the great advantage is, that the fine earth, which in such weather is pretty dry, clings at once closely about every root; sticks to all and every part of it; and, if this precaution be taken, and the rest of the work be well performed, no man need fear to plant a *young* tree in any part of the month of May, except, indeed, the very hard and naked rooted trees, such as the Oak and the Hickory. I should not be at all afraid to make a plantation of Locust or Ash in this way at any time before Midsummer.

78. One great advantage of planting in dry weather is, that you do not batter the ground and make it as hard as a brick: when the dry weather comes, of necessity there must be a great deal of trampling of the ground. In pretty

close planting it must be trampled upon pretty nearly all over; and if this take place in wet weather, the ground will become baked, and, consequently, destitute of fertility when the dry weather comes: there will be less dews; and, in all respects whatsoever, the ground will be less fit to promote the growth of the trees.

OF THE CULTIVATION AFTER PLANTING.

79. Some people imagine that trees, the roots of which are never seen, and that are known to go so deep into the ground, care nothing at all about what takes place on the surface of the earth. How happens it then that the Americans, when they find their orchards beginning to decay; find the trees having a great deal of dead wood coming in them, and find them to bear smaller fruit than usual; how comes it, that they, who are by no means apt to be too prodigal of their labour, send the plough and harrow amongst the trees, and manure the land? How comes it that an Oak tree, which penetrates down into the ground to a distance equal to that between the ground and its summit, will beggar, when growing by the side of a turnip-field, all the turnips growing within several yards of its trunk? It is not its *shade* that does this mischief to the turnips, for it takes place on the south side of it as well as on the north, which I have witnessed in hundreds of instances, and which every farmer knows to be true. The truth is, the trees draw their nourishment, principally, from the ground near the surface; and, as they pull much harder than the turnips, or any thing else of the herbaceous kind, their roots will have the greater part of the manure, put as much as you will into the ground.

80. Very erroneous, therefore, is the notion, that weeds

and grass do trees no harm; for they do young trees more harm, perhaps, than they do to any other thing. Yet, we every where see gentlemen leave the young trees to take what care of themselves they can. They are planted, and are left to contend single-handed against all the battalions of grass of every sort, docks, thistles, dandelions, nettles, and all those weeds, any one plant of which sucks out more of the virtue of the ground than any young tree in the world; and if the winter did not come in mere charity, to cut them down, the trees would never surpass them in height. Nothing can be more miserable than to see a plantation of young trees thus infested. The weeds draw out all the moisture of the ground in dry weather; they shade the stems of the trees, which is a very great injury; the creeping kinds crawl up them, hamper their leaves and twigs, and, not unfrequently, you see the trees completely stifled by them. None but the hardy kinds will endure treatment like this for any length of time. They die, in short, in great proportion, and those which survive are in a miserably stunted state for many years, unless they have the good luck to beat the weeds, and to get the soil for their own use.

81. Young trees, therefore, should be kept clean: a plantation ought to be kept as clean as a hop-garden; and, like that of the hop-garden, ought to be dug with a fork every winter. It is best not to dig too early; because the ground runs together in consequence of the quantity of the wet that falls upon it before the spring; late in February, or early in March, is time enough to dig it. The winds in March dry it through and through, and then the rains in April and May make it fine and light all the summer; easy to *hoe*, and the weeds easily kept down.

82. I should like for some gentleman to leave a small part of his plantation to take its chance in the usual way, and to cultivate the rest in a proper manner. He would soon find, that his additional expense would be paid for a hundred fold. It is not the extent of a plantation: it is the height and bulk of the trees; it is the quantity of timber, and not the breadth of land, that a man ought to look at. If trees be planted at the distance that I shall give directions for planting them, the expense of cultivation will cease very soon; for, in a couple of years, their roots and their shade together will have totally subdued the whole of the multifarious race of the natives of the soil. The shade will finish what the roots have begun; and the seeds of the weeds must lie in the ground and wait patiently for the felling of the plantation. There they *will lie*, however, till the summer sun can get at them; and, whenever it does, up they will come.

83. Before I conclude these general remarks, I must add a few relative to the question; namely, whether it be proper to plant *a mixture of trees in one and the same plantation;* and I have to declare my opinion decidedly in the negative. This is a very important matter, and merits the greatest attention.

84. If the plantation be intended to be merely ornamental, a mixture of trees may, according to some tastes, be deemed desirable; though that is not my taste; nothing appearing to me much more disagreeable to look at than a ragged wood, some trees without and some trees with leaves; some with their leaves still hanging on, but in a half dead state, while others are pretty nearly green. However, this is merely matter of taste; I like uniformity of growth and of hue; others may like the contrary; and

if they do, they will, of course, when they seek mere ornament, put different sorts of trees into the same plantation; making up their minds, of course, to see some of them a couple of feet high, while others are thirty or forty feet high. But, whatever men may do when they plant for mere ornament, they ought to be a little more careful about insuring *growth* in the trees when they plant for profit, and with a hope that their plantations will become fortunes for their children.

85. In all cases where plantations are made for the purposes of producing timber or underwood, all the trees ought to be of one and the same sort; and, as nearly as possible, of one and the same *size* and *height*. A Mr. Pontey, in a book which he published about planting, gave it as his opinion that a plantation ought to be composed of trees of various sorts; because, as he asserted, their roots had a *variety of tastes*, those of one tree liking (or being *partial* to, as the *ladies* call it) one sort of diet, and those of another tree, another sort of diet! He also contended that there were these different sorts of diet in the ground; and that therefore, a Beech, a Birch, an Ash, an Elm, and an Oak, might all live very harmoniously together, seeing that one would feed greedily upon what all the rest would reject; and that, thus, you might as well have ten trees as one, if there were room enough for their trunks.

86. It is truly surprising that any man should put forth opinions like these at the end of almost the hundred years that Mr. Tull's famous work on the horse-hoeing husbandry has been within the reach of every man in England, and has been in the libraries of all gentlemen in England who have considerable libraries, for pretty nearly a hundred years. This book taught the very first beginnings of the

drill husbandry; it attracted wonderful attention in its author's day; the Encyclopedias of late years dwell largely upon the Tullian system; and yet, with the demonstrations, the clear and indubitable proofs, of the erroneousness of this notion before him, Mr. PONTEY puts it forth as admitted truth. A Mr. BRADLEY, who had, in the time of Mr. TULL, written a good deal upon husbandry and gardening, had ascribed to vegetables the sense of *taste*, "by which," says Mr. TULL, "he thinks that they take such nourishment "as is most agreeable to their respective natures, refusing "the rest; and that they will rather *starve* than eat that "which is disagreeable to their palates." Mr. BRADLEY had said, in few words, "they feed as differently as horses do from dogs, or as dogs do from fish." But, Mr. TULL discovers, that the same writer, in his work on gardening, asserts, "that Thyme, and other aromatics, being planted "near an Apricot tree, would in time destroy that tree." WHY? What reason is there for supposing that these little plants would destroy the tree? It could not be their *shade*: it could not be by depriving it of even the smallest portion of sun or air. The rains, too, would go down to its roots in spite of these little creeping plants; and, as they are at the extreme point, with respect to difference in nature to an Apricot tree; as their food ought, according to Mr. Bradley, to be as different from that of the Apricot as the food of horses is from that of dogs; or, as the food of dogs is from that of fish: what in all the world could make Mr. BRADLEY say, that these little diminutive plants, if standing near an Apricot tree, would in time destroy that tree? Mr. TULL might have said so, and did say so, with perfect consistency; for he contended, and he proved beyond all doubt, that the nourishment was of the same kind for roots of all sorts.

87. If roots of different things take different food out of the same ground, how is it that the roots of an Oak tree, or any other tree, destroy turnips or corn growing upon the top of the ground in which the roots of the tree are? It is well known to gardeners, that to have flourishing wall-trees you must not plant perennial flowers, or any devouring plants, along the borders where they stand. Mr. Tull, during his arguments upon this subject, observes, that if plants of various sorts, fed upon nothing but one particular portion of the soil, and left the rest for other plants to feed upon, there could be very little reason for keeping the ground clear from weeds; for that the weeds being totally different in their nature from wheat, for instance, might live very happily along with the wheat; that they might reckon their seeds together in the same piece of ground, without any injury to the crop of either! This absurdity was attempted to be got over by the adversaries of Mr. Tull, by saying that the weeds robbed the wheat of part of the *air*, that it would otherwise have had; that they shaded it more or less, either at stem or at top. To show the absurdity of this defence, which was, indeed, nothing more than a miserable shuffle, Mr. Tull proposed to leave a piece of wheat with a certain portion of rather tall weeds in it; to clear another piece of equal extent of all weeds whatever; and then, to stick up amongst the wheat which had been cleared of the weeds little sticks or twigs, in bulk equal to the weeds in the other piece of wheat; and then he ventured to pledge his life, that the crop in the piece of wheat having the weeds left in it, would not amount to more than three-fourths of the crops having the sticks and the twigs. None of his adversaries ever accepted the challenge, and his principles remained triumphant.

88. It is quite clear, therefore, that all trees feed upon the same sort of nourishment; and that, by planting different sorts of trees in the same plantation, you gain nothing by this imaginary difference in their tastes. But you lose a great deal by mixing them in a plantation. There are no two sorts that keep pace exactly with each other in point of growth. Some sorts increase in circumference of stem, and mount more slowly, than others. Some go up with side branches, not much extended; others spread out very much, and of course mount not so fast. It is impossible, then, that in a mixed plantation, the growth in point of height should be uniform; and, if it be not uniform, some trees must be *shaded* by others. This shading soon brings drip along with it; and though the Hazel, the Willow, and some other sorts of underwood, will, to a certain extent, live, and grow a little under drip, even they will not thrive in such a situation; for who has ever seen a wood, nearly the whole of the ground of which was shaded with lofty trees, and seen at the same time and in the same ground a thriving underwood?

89. But, besides the shade arising from the inequality in the growth of trees, there is the inequality in the portion of *food*. One sort of tree devours a great deal more than another. Its roots are more numerous, larger, spread about to a greater extent, and actually starve trees of another sort standing near it. I will venture to engage that if a Locust tree were planted with a Lime, a Horse Chesnut, a Beech, and even an Elm, all planted at the same time, and being of the same size and height, and all the rest standing within two feet of the Locust tree; I will engage that, at the end of ten years, the Locust tree would have destroyed, or made next to nothing of, all the others, while it would be a tree of thirty or forty feet high, extend-

ing its branches over the tops of every one of the others, and leaving nothing alive of them, excepting the mere stumps. In the making of plantations, trees would not, except in particular instances, to be hereafter mentioned, be planted so closely, as within two feet of each other; but, if it were within four feet, or even six feet or more, the effect would be proportionately the same: the roots of the aspiring tree would rob those of the other trees; and though it might not actually extend its branches over the tops of them, there would be the side shade, and all the injuries arising therefrom.

90. Therefore all the trees in a plantation intended to produce timber, and all the plants of underwood intended to produce poles, hoops and the like; all the trees and plants, in every individual plantation, ought to be of one kind. This has been very judiciously attended to by Lord Viscount Folkestone, in some plantations of Locusts, which he made in the Spring of 1823 or 1824. The whole of his plantation of that year, consisted of perhaps thirty or forty acres; but his Locusts, which he did me the honour to have from me, he planted in *clumps*, in divers parts of the plantation, and agreeably to my advice, at the distance of four feet apart, having no other trees planted with them. I saw these clumps in the fall of 1826, many of the trees being more than twenty feet high, almost all being pretty nearly of an equal height. The rest of the plantation had been made on the mixture plan. It was difficult to say how that would go on, for the trees had made comparatively little progress, while the Locusts were really beautiful clumps of trees, notwithstanding that they were no taller than the other trees, at the time of their being planted.

91. Not only ought the trees, therefore, to be all of the same kind; but, as nearly as possible, of the *same size and height;* for a stout tree will get a head of a feebler one; it will shade it above and circumvent it beneath. If, therefore (and this is always the case), your plants come out of your nursery of different sizes, *sort* them before you begin planting; and plant all of the same size together. They will then all grow up of the same height; and though one part of your plantation, will perhaps be less lofty than another for nine or ten years, that is of very little consequence, and is not even disagreeable to the eye.

THE TREES,

ARRANGED IN ALPHABETICAL ORDER, WITH THE INSTRUCTIONS RELATIVE TO EACH.

92. It will frequently happen, that a tree will have to be called by two or more different names. The LOCUST tree, for instance, is called the FALSE ACACIA, or PSEUDO ACACIA; and some readers would look for the instructions relative to that tree, under the word ACACIA, and not under the word LOCUST. Then, again, there are some trees, which all belong to one family, and yet that go by different names. For instance, there are the ABELE and the ASPEN; but these are POPLAR trees; they are nothing more than different sorts of *Poplar*; and, therefore, a description of them, as well as every thing relating to them, will be found under the word POPLAR. In order, however, that no inconvenience may arise from this arrangement, an index will be found at the end of the Book, and will of course be published with the last Number, containing *all* the names, that are, as far as I have ever heard, in any thing like common use. This Index will be in Alphabetical order, of course: the names will be the English names, followed by the Botanical names: so that, if the reader have not been accustomed to make use of the word *Locust*, for instance, he will look for the word *Acacia;* and against that word he will find, "See LOCUST." If he look for ASPEN, he will find "See *Poplar*." Amongst the American Trees, there is one which is commonly called BASS WOOD. I have called this by the American name, but it is a LIME Tree; and the

Latin name is Tilia Americana; therefore, when the reader looks at the Index, for the word *Lime*, he will, in one of the instances, find "See *Bass Wood*." This Index is, therefore, a thing of great importance, and must be attended to by the reader, who will otherwise experience great mortification. The Index is made out according to the *commonest English* and *American* names. The Botanical name is added, but I have not thought it necessary to make a Botanical Index also. Particular trees go by different names, in different parts of the country. I have, in every case, therefore, taken all the common names that I have ever heard of; and if the reader do not find the name of any tree that he wants to read about, in the part of the book where he would expect to find it; for instance, if he do not find the Aspen Tree in that part of the book where the Alphabetical order would induce him to expect to find it; let him then turn to the Index, there he will find, "Aspen. See *Poplar*." Having given this explanation, I now proceed to take the trees one after the other. According to the Alphabet, Abele would be the first and Acacia the second; but, as the first of these will come in its proper place, under the word Poplar; and as the second will come in its place, under the word Locust, I begin my observations and instructions with the Alder.

THE ALDER.

In Latin, *Alnus:* in French, *Aune.*

93. The botanical characters are:—It hath male and female flowers, at separate distances on the same tree; the male flowers are collected in a cylindrical katkin, which is scaly, loose, and imbricated on every side, each scale having three flowers, which have two minute scales on the side. The flower is composed of three equal florets, fixed to the empalement by a single scale; each floret is of one leaf, divided into four oval segments which spread open; these have four small stamina, crowned by double summits. The

female flowers grow in a katkin, in the same manner as the male. The common katkin is imbricated, having three scales which are every way opposite, fastened to the central string or axis, having two heart-shaped flowers pointing toward the apex, where it is situated. They have no visible petals, but a short oval germen, supporting two bristly styles, which are the length of the scales of the empalement, and crowned with a plain stigma. It hath no pericarpium, but the seeds are included in the scales of the katkin, which are oval and winged.

94. There are two other descriptions of Alders in England, and there are several in America. But these are of the *Frangula* tribe; their seed is in a *berry*, and not in a *cone*, like that of the common Alder. There is an American Alder, which is, in England, looked upon as an ornamental shrub, on account of the whiteness of the under side of its leaf. This is what the Americans call the *Black Alder*, the upper side of the leaf being of a very dark green. But, with these varieties this work, which must, generally speaking, confine itself to *Forest Trees* and *Underwoods*, has nothing to do. The common Alder of England appears to be precisely like that of America in all respects: it will, therefore, be useless to speak of any other.

95. The ALDER: ALNUS GLUTINOSA. That is, the Common English Alder, is seldom suffered to grow into a timber tree; but there is no doubt that it would become a timber tree if suffered to grow after the manner of *Oaks* and *Elms*. The uses to which the *Alder* is put do not make it necessary that it should grow into a large tree. It is used for poles; for the making of the wood part of brushes; for the making of clogs, pattens, and heels of shoes; and for various other purposes that do not require great size in the wood. The wood is light and brittle, and does not last long if exposed to wet. It makes but a very poor hop-pole, and is, in short, fit for very few uses by which it is exposed to the weather; but it is of very fast growth; it

does for many purposes under cover; and the tree grows in places in which trees producing better timber will not grow.

96. Like all other trees, the Alder may be raised from seed. It bears what is called a katkin, like the *Willow*, the *Nut*, and the *Birch*. This katkin is green, in the first place; it afterwards becomes brown, and it will, if suffered to do it, hang on the tree till the next Spring. When it is dry, rub it to pieces, and you will see the little flat seeds, each with a sort of wing to it. A single katkin contains, perhaps, a thousand seeds or more. The katkins need not, however, be rubbed to pieces, until it be time to sow the seeds, because the seed keeps best in the katkin.

97. The seed of the *Alder* may be gathered from the tree, as soon as it is dry; then made perfectly dry in the sun or before a fire; and then put into a bag or box and kept in a dry place. The time of sowing is the month of March or April; but as to the *manner* of sowing, that will be found to be described under the head of Birch. When the plants are up, manage them in the same manner as directed for the Birch. But there is another and more common mode of managing the Alder; that is to say, not to raise plants from seed; but, from cuttings of about two feet long, and about the size of a common broom-stick. These are cut at any time between the months of October and March, and are planted, in a sloping direction, in beds or plantations, where they stand at about four feet apart in every direction. But care must be taken not to leave too much of the cutting above ground; perhaps five or six inches are quite enough. Here the plants grow, sending out several shoots, which are all to be cut down close after two years' growth, and the next shoots grow up to poles.

98. I do not believe, that, even as underwood, the stems raised from cuttings are any thing like so good as those raised from seed; but there is no difference in the manner of cultivating. If the plants be raised from seed, they ought, after having been one year removed from the seed-bed, to be put into the plantation at the same distances as directed for the cuttings; and, if they be planted in the fall of the year, they ought to be cut down within an inch of the ground in the next month of April. If they be not planted till late in the spring, it will be best not to cut them down until the spring following; but, cut down they must be, by all means, and very nearly close to the ground.

99. The Alder will live, and even grow, in pretty dry land; but its delight is in wet, and very wet, land. It likes the sides of running brooks, especially where the water breaks out and steeps the land. The Alder will grow most luxuriantly with water constantly around it; but it thrives best, not in a mere swamp, but in ground that is very wet; and it by no means dislikes stagnant water. Hence an Alder plantation is generally called an *Alder bed*, as an Osier plantation is generally called an Osier bed. In such situations, the Alder-shoot soon becomes a pole, and a very straight pole too, though exceedingly brittle. It will be cut down, of course, of the size that is required; but, generally, about ten years' growth produces poles of twenty feet or more in length, each with a butt of from four to six inches in diameter. These are cut off, as closely as possible to the ground, at any time between October and the middle of February; because the sap is then down, and there is no danger of what is called bleeding, where the cut is made. The cut should be as smooth as possible; and the hook, or the axe, should not give a *downward* stroke, but an upward

stroke; for, if the cut be downwards, it leaves a raggedness upon the stem, which lets in the water to a certain extent, and produces rottenness and weakness.

100. The poles being cut down, should, as soon as possible, be not only trimmed up by taking off the brushwood or spray from them, but they should, with as little delay as possible, *have their bark taken off*. This is done in the following manner: you take two stakes, and drive them into the ground in a sloping position, so that they cross each other at a point distant from the ground about the height of a man's breast. Then fix two other stakes in like manner, at about ten or twelve feet distance; you then lay the pole upon these two crossings of the stakes, and with what is called a *draw-shave*, you take off the main part of the bark. This operation is always performed upon poles of this kind before they are put up in the hop-gardens; and, except by very slovenly people, before they are applied to any use, whether within doors or without.

101. If it be desirable to have a large piece of Alder for any purpose, the tree should certainly be raised from the seed; but there are so many other trees to produce boards and other wood for temporary uses, that the Alder can scarcely ever be wanted, except for poles and for the other uses above mentioned. The wood is light, and it admits of a polish not much amiss, but it is brittle almost beyond any thing, and it cannot be *safely* trusted for more than *one* year for a hop-pole. This circumstance renders it greatly inferior to the Ash, and even to the Willow; but then it will thrive where the Ash will not grow at all; and, in the same situation, it will make a pole of double the size that the Willow will make in the same space of time. As fuel, it is beyond all measure inferior to the Ash and to

every thing, as far as I can recollect, except the Poplar tribe; but, on the other hand, what it does produce, it produces quickly, and the tree has always this great recommendation, that it will thrive well in the most swampy places, and will, sooner and more effectually than any other tree, convert an ugly swamp into a good-looking plantation. When cut down, it is quickly up again, and it soon overtops all weeds and sedge, and every other thing that infests the land in which it grows.

THE ASH.

In Latin, *Fraxinus;* in French, *Frêne.*

102. The botanical characters are: it has hermaphrodite and female flowers on the same tree, and sometimes on different trees. The hermaphrodite flowers have no petals, but a small four-pointed empalement, including two erect stamina, which are terminated by oblong summits, having four furrows. In the centre is situated an oval compressed germen, supporting a cylindrical style, crowned by a bifid stigma. The germen afterwards becomes a compressed bordered fruit, shaped like a bird's tongue, having one cell inclosing a seed of the same form. The female flowers are the same, but have no stamina.

103. This tree is, on every account, one of those which is of the greatest consequence. The manner, therefore, of raising it, ought to have particular attention bestowed upon it. There are several sorts of Ash, if we include, as we must, those of America; but, though it will be necessary to give so much in the way of description as shall be required to distinguish one sort from the other; and though there is some difference as to the nature of the seeds of different sorts of Ash: still, the manner of propagating, of planting, of cultivating, of pruning, and of cutting down and applying to use, is the same in all cases, as far as

regards the ASH. It will not, therefore, be necessary to repeat what I have to say on these matters; but to say the whole of it, once for all, under the head of our own native ASH, with which, therefore, I begin my account of this family of trees.

104. COMMON ENGLISH ASH: FRAXINUS EXCLESIOR. It is well known that the Ash grows to a very great height, and that it will, if left to grow, become a very large tree. It is also well known, that it is a beautiful tree. GILPIN calls it the Venus of the woods. It has, however, one great disadvantage; that is, that it puts on its leaves later in the spring, and loses them earlier in the fall, than any other English tree. But perhaps GILPIN was thinking of a *naked* VENUS, and then, indeed, the ASH claims the pre-eminence in our woods. Laying aside this nonsense, however, of poets and painters, we have no tree of such various and extensive use as the ASH. It gives us boards; materials for making implements of husbandry; and contributes towards the making of tools of almost all sorts. We could not well have a waggon, a cart, a coach or a wheelbarrow, a plough, a harrow, a spade, an axe or a hammer, if we had no ASH. It gives us poles for our hops; hurdle gates, wherewith to pen in our sheep; and hoops for our washing-tubs; and assists to supply the Irish and West Indians with hoops for their pork barrels and sugar hogsheads. It therefore demands our particular attention; and, from me, that attention it shall have. It is underwood as well as timber; and I shall have to treat of it in both these characters.

105. As to the soil, no tree that I know of, except the Birch, is so little choice as the ASH. On dry ground, on wet ground, on sand, on clay, on chalk, and on almost a swamp, if it be not quite filled with water, the ASH will grow and thrive, if it have anything like fair treatment. It has another quality,

which must render it particularly suitable to exposed situations, namely, that it fears not the winds. I do not mean the power which the winds have in bringing it down; though it is pretty stout in that respect, and does not come trembling about like an Elm before every south-western puff. I mean that sort of power which the winds have in checking the growth of trees, and especially the winds near the sea-coasts. On the Hampshire coast, the wind that comes from the Atlantic is, of course, a south-west wind. You will see the oaks when exposed to this wind, shaved up on the south-west side of them, as completely as if shaven with a pair of shears. The head of the tree resembles the top of a broad quickset hedge, which is kept sheared up in a sloping form on one side only. The head of such oak is still more, perhaps, like the roof of any semi-circular building clapped up against a house; and at the same time, the everlasting flinching of the tree, and the continuance of the weight on one side, while it is kept shaven off on the other, makes the trunk of the tree lean away from the south-west. Close by the side of an Oak like this you will see an Ash, of equal height and size, standing as upright as if in the warmest of valleys; and I have looked, with the most scrutinizing eye, without ever having been able to discover that any of the shoots pointing to the south-west, had received the smallest injury. I have seen thousands and thousands of instances of this hardiness in the Ash, and a very valuable quality it is, though this astonishing hardiness is, it must be confessed, but little consonant with Mr. Gilpin's ideas. He called the Oak, the "Hercules of the Woods;" and, as I have shown, this Hercules flees at the bare approach of that which the Venus sets at defiance.

106. The seeds of the Ash are vulgarly called ash keys; but for what reason I know not. They follow an insigni-

ficant blossom, and hang upon the most prominent branches of the tree in great bunches. Each seed is about an inch long, including a sort of wing at the point of it: and these seeds ought to be suffered to hang on the tree till they be quite brown, which they will be in the month of November. The kernel of the seed is about half an inch long, in a flat form, and is covered by a husk tightly drawn over it. If you be curious, and have a mind to see a tree in embryo, take an Ash seed, put it into a little water lukewarm, and there let it remain for three or four days. Take it out: take a sharp knife, split the seed longways down the middle, and there you will see, standing as upright as a dart, an Ash tree, with leaves, trunk, and stem; that is to say, the head of the root: and all this you will see with the naked eye, as clearly as you ever saw an Ash tree growing in a field or meadow.

107. Of all the trees that I know any thing of, none bears seed more abundantly, or more easily to be collected, than the Ash. This seed (of our English Ash) will not germinate *the first year after it has been produced.* By soaking, by artificial heat, and by some other means, perhaps, it might be made to come up the first year; but, as millions of seeds will lie in a comparatively small compass, and as there is no difficulty in keeping the seeds, the best way is to keep them through the winter and summer, and to sow them the next year. The seeds, when gathered in November, ought to be mixed with sand, three bushels of sand to one bushel of seeds; and the heap should be laid in a shed, in an outhouse of some sort, in a cellar, or in some place where in would not run the risk of being flung about. At the time of mixing, the whole mixture ought to be made pretty damp. If the heap were laid out of doors it would not signify, so that it were guarded against all molestation.

It should be turned and remixed now and then. Lying in this state, produces a softening, absolutely necessary to the vegetation of the seed. *Mere age* will not do; for I remember keeping some Ash seeds in dry sand, which came up, indeed, after they were sown, but which lay in the ground another year before they came up. If kept dry, I think it likely that seed would remain good for, perhaps, fifty years; but it will needs have one clear year to soften in, before it come up.

108. But you must take care not to be too *late* in sowing the seeds, in the second year of their age; for, if you have kept them moist, they will begin to start by the month of March, or before: so that the safe way is to sow them in the month of November, just about one year after you have taken them from the tree. The manner of sowing is this: the ground should be as good as any that you have got; it should be dug deeply; it should be manured a little, if you have any manure to spare; and when the whole of your piece of ground is dug, you ought to proceed in the sowing in the manner which I shall here very fully describe, because it is precisely in the same manner that the seeds of many, and indeed of most, other forest trees, ought to be sown. This one set of instructions will serve for the sowing of so many sorts of trees, that I must request the reader's particular attention to it.

109. The piece of ground having been duly prepared, you make a straight line on one end, or one side of it, and begin to lay it out into beds of three feet wide, with alleys of fifteen inches wide; that is to say, such an alley between every two beds. In order to do this with regularity and facility, you provide two straight sticks, each of them four feet three inches long, and you cut a notch round each of

them at fifteen inches distance from one of its ends. Two men do the work, one at one end of the line and the other at the other. Having made a straight line on the outside, by chopping along with the spade, they suffer the line to stand there till they have laid down their sticks, one at the one end of the line and the other at the other, perpendicular from the line. Then they take up the line, and place it on the ground again, so as to come over the notch at three feet from the point where the line lay before. They then begin to mark out the alley by treading the ground along by the side of the line. Having done this, they take their spades and mark the alley more distinctly, by a little chop made along by the side of the line, and by drawing a little of the ground into the alley. They then (the sticks having lain on the ground all the while) move the line, so as to make it come to the end of the two sticks. They then tread and chop as they did before, in order to mark this other side of the alley. Thus they have marked out a bed three feet wide, and an alley fifteen inches wide. When they have done this, they, *before they move the line*, move their sticks, laying the three-feet ends of them to touch the line, as they did before. They then move the line, place it over the notches of the stick, as before directed, and then they proceed to tread and to chop, and thus to form a second alley and a second bed.

110. In this manner they proceed, till the whole of the ground is laid out in beds and alleys. These large spaces of fifteen inches wide for each alley may, to some persons, appear to be a waste of ground; but, whoever has had much experience in the matter, must know that less space is not sufficient. The earth has to be taken out of the alleys, for the purpose of covering the seeds. The sides of the alley cannot be perpendicular, without leaving the

earth to crumble down. The alley, therefore, will become narrower than fifteen inches; and, as to the beds, they cannot be weeded if wider than three feet, without being trampled on by feet, or being pressed by hands not much less injurious than the feet. In short, nothing, in a case like this, is so cheap as the ground. It ought not to be spared, after you have been at the pains, and at the expense, of preparing the seeds to sow in it.

111. After all the ground is laid out into beds and alleys, the beds ought to be broken fine with the spade, or with the rake; stones, bones, chips, every hard and rough substance, ought to be taken off; and if the ground have not been broken very fine in the digging, it ought to be well broken now, before the sowing begin. When this is well done, the sowing may begin; and it is executed in the following manner: the mixture of seeds and sand is taken to the ground. The sower, furnished with a bowl or a basket that he can take in his arm, goes along the alleys, and drops the mixture upon the beds in such a way as that the seeds may lie one of them in every square inch, or thereabouts. It is not necessary to be very nice: if there be here and there too wide a vacancy, or if the seeds lie now and then upon one another, it is of very little consequence; for if sound and well kept, and of due age, they will every one of them grow, and will be up and bespangle the ground with beautiful seed leaves in the month of April, or early in May.

112. The seed lying thus scattered upon the beds, is next to be *covered, two inches thick,* by taking the necessary quantity of earth out of the alleys. The man who does the work, throws up, as he goes along, earth sufficient to cover half of each of the beds that adjoins the alley; he breaks the

earth very finely in the alley before he lays it upon the bed; and when he has laid it on the bed he spreads it smoothly over the seed, and breaks it very finely. Even before he do this, it is good to go over the beds, and to pat the seed close down to the earth with a spade or with the head of a rake; and, as the earth is laid on, great care should be taken to break it fine and to press it down upon the seed, so that the seed may be well fixed in the ground, and not liable to be washed out by rains, heaved out by frosts, or dragged up by worms. This work of covering the seed should be executed, if possible, when it does not rain, and when the ground is not very wet; for, if very wet, the earth will cling about the spade and also about the feet of the workmen; and, which is of much greater consequence, it will leave the ground in lumps upon the seeds; it will cause there to be cavities when the ground becomes dry; the winds will be thus let in and the young plants will perish or be stunted.

113. The reader will easily perceive, that, if necessary, ten hands instead of two, and a hundred instead of ten, might be employed at one and the same time on such a job: some shifting the line, some treading, some chopping, some breaking the earth upon the beds, some sowing the seed, some patting the seed down, and, finally, two men or more in every alley at work covering the beds. Those who cover the beds, must take great care not to break the edges of them: they ought to slope the edge towards the alley; that is to say, to make the alley narrower at the bottom than at the top; and by all means to keep the edge of the bed firm. When the whole piece is sowed and covered, care ought to be taken that no dogs, cats, pigs, or any thing else come to disturb the beds. I have never perceived that mice meddled with Ash seeds;

and, therefore, it may be unnecessary to take precautions against them; but, if moles appear, they should be destroyed instantly, and so should mice, if they should take a fancy to such things; for it is quite useless to put seed into the ground, and then abandon it to its fate.

114. The sowing having taken place so early as November, the ground will necessarily become hard before the month of April. It will first be battered by the rains, then heaved up by the frost, then battered down by the rains again, then dried and baked by the winds and sun of March and April. This will not prevent the seeds from coming up, for they would almost find their way through a brick; but, if the ground be very stiff in its nature (and we are not always at liberty to choose our ground), the plants will be feeble, and they never will thrive well until this hard ground be broken about them. The best way, therefore, is, when the winds of March have just begun to dry the ground, to go with an iron rake and just *break* the ground at the top, by pushing the teeth of the rake upon it from you, and by taking about an inch wide of ground at a time. This will open the ground for the seeds to come up; and if, after this operation, the ground get *dry*, no rains will make it stiff and hard, and the plants will come freely up, and be in a beautiful state.

115. About the middle of May, the weeds, in all their pernicious varieties, will begin to carry on a contest against your plants. If Mr. PONTY'S and Dr. BRADLEY'S doctrine were true; that is to say, if the weeds did not feed upon the same sort of food as the ASH trees, you might save yourself the trouble of weeding them; but, as this doctrine is false; as the weeds would soon starve your plants, which would perish little by little, or which would, in the follow-

ing Autumn, be such insignificant things, as to leave you no hope of ever making any thing of them, it is absolutely necessary that you keep the ground clear of weeds. This is done by the hands of people, going along between the alleys, pulling the weeds out with their hands, and either putting them into baskets to carry them away, or throwing them down into the alleys. The former is best, but is not always convenient; at any rate, ALL the weeds and grass should be taken clean out at the first weeding. It is slovenly and scandalous work to take out nothing but the prominent weeds; the little weed that is left will become a great weed in a very short time, and the sooner, because its seniors have been removed. Weeders, if left to themselves, will always leave a stock in order to continue the breed, upon the same principle that mole catchers absolutely refuse you, and assign the reason at the same time, to catch a mole in the breeding season. The weeding should, therefore, be thoroughgoing work; it should not be a partial removal of the obnoxious plants; it should not content itself with merely plucking out the great staring things, and leaving the little underling, but perhaps much more efficient agents in the work of mischief: the planter should, in short, imitate the Duke of Wellington; that is to say, take out all quite clean, down to the very chick-weed, and not to leave any one under the name of *lamb's lettuce,* or *fat hen,* or any other appellation indicative of harmlessness; even these apparently inoffensive things should be taken out, and that too, if possible, to the very bottom of their tap root. It may be impossible to do this with regard to docks, thistles, and dandelions; but, in the first place, before the ground is begun to be digged, you should go over it, and take up all these with the greatest possible care, and as deep as you can; and then the diggers should be made to take out, as they go on, every bit that

they find of these troublesome weeds. If any still remain, you cannot get them up from the bottom without digging up your plants; you should have a long knife, therefore, and cut off their tap roots to as great a depth as possible. This done a couple of times, will make them very feeble for the future, and will at any rate rid your plants of their company for the summer.

116. A second weeding must take place about the latter end of June; and a third about the middle of August; and, at every weeding, treat the weeds exactly as the DUKE of WELLINGTON has just now (February, 1828) treated the faction called the Whigs.

117. In the month of October, your plants, supposing your ground to be pretty good, and your management to have been as I have directed, will be from five to seven inches high; and there would be, if sown as thickly as they might be sown, forty thousand plants upon one single square rod of ground; but, supposing there to be but ten thousand, you get a hundred thousand plants upon ten rods of ground; and that is enough to plant forty acres of land, the plants as close together as it appears to be, in such case, advisable to plant them. Is it not surprising then, that any gentleman who is about to plant should decline to take the pains, the very small pains, the very trifling expense necessary to secure to him such a stock of plants? Ash seeds are to be gotten every where in the proper season. Any great country girl would get a sack of these seeds with nearly as great ease, and with much greater safety to herself, than she would fill the sack with the tearings of a hedge. The seeds for ten rod of ground could not, to any gentleman in the country, cost above a shilling; another shilling would mix the seeds with sand; five shillings

would dig the ground and sow it; another five shillings would be ample pay for the weeding of it; so that, unless a gentleman could talk of the rent of ten rod of ground, while more than forty rods are thrown away in the kitchen garden of every gentleman, the whole of the cost of this one hundred thousand plants would be only *twelve shillings*, much about three halfpence a thousand; and I appeal to any man who understands the business, for the correctness of all that I have here stated.

118. Now, as to what is next to be done with these plants; that must depend upon circumstances. Generally speaking, it is desirable to remove them, and to let them stand in their new situation for one year or more; but, if I had ground *quite ready* for planting; if it were clean, and especially if it were rich, I should plant out the trees at once; but, in other cases, it would be advisable to remove them into a nursery, where they may stand for one year or for two years, and be always ready to go into plantations. This work of removal from the seed bed is performed in the following manner; and, as I shall have frequently to refer to this part of my work, I must, as in the case of sowing the Ash seeds, express a hope that the reader will pay particular attention to the advice I am now about to offer him.

119. The ground which is to receive these young plants ought to be prepared in the same manner as is described in paragraph 108, relative to the preparing of the ground for the sowing of the Ash seeds. The work ought to be performed at some time between October and May. May is rather too late; but really any time between the latter end of October and the beginning of May may do very well for these plants, which are little more difficult to take root

than a cabbage plant is. The work, however, never ought to be done, if you can possibly avoid it, in *wet* weather; and in the *rain* by no means whatever. The weather may become very dry before the month of May, but even that is a great deal better than wet weather; nor is there any danger in the drought, if you take the precautions which I am now about to mention.

120. You begin the work (after you have prepared the ground), by taking up the whole of your plants; you then *sort* them into large ones and small ones, for such there will always be in every seed bed; next you lay them by the heels in the manner described in paragraph 70. It is desirable, even at this early period, to divide the large from the small; and, perhaps, and certainly in some cases, it may be advisable to divide them into three classes; because, if you mix them either in the nursery or in plantations, the strong will not only preserve their mastership over the weak, but will go on, as is too much the case in the affairs of mankind, augmenting their power and oppressions, in an increased proportion; so that, at the end of five or six years, or, indeed, at the end of two years, one would scarcely believe it possible that these were all plants that were sown in the same beds on one and the same day. If classed properly, they do not injure one another; and therefore I strongly recommend this classification.

121. The ground being duly prepared and the trees ready, you begin the work thus: you dig the ground, as you proceed, over again. Strain the line along the end or side at which you are beginning; you make a chop along by the side of the line, and take out, all the way along, a couple of spits of earth, and fling it back over the ground, or wheel it to the end where you are to leave off. When

you have made the trench clear all along by the side of the line, to the depth necessary to receive your plants, you bring the plants, with their roots pruned, in the manner directed in paragraph 72, and place them along, with your hand, just to touch the line, and with the bottom of their roots resting upon the earth at the bottom of the trench, in such way that each plant may stand not *quite so much* sunk into the ground, as it was when it stood in the seed bed. You will see precisely how much of it was under ground before; and you must take great care not to put more of it under ground at any rate; and the best way is not to put so much of it under ground by an inch in depth.

122. When you have fixed a row of plants, at about six inches apart, just so as to touch the line, and have crumbled the earth well in about their roots, put some earth lightly up to them with the spade, and tread that earth up against them, or rather upon their roots, with your foot. Press it hard and firm about the roots of the plants. When you have done this, they will stand with the level ground behind them, and with a trench before them. You go on now as if you were continuing to dig the piece of ground again. You begin with your first line of spits to fill up that part of the trench along which the young trees are placed. The rows of trees ought to be about eighteen inches asunder; therefore, when you have dug on, for the distance of two feet, from the row of trees just planted, and have levelled the ground nicely, you remove the line, and place it across your piece of ground eighteen inches from the place where it stood before. This will leave six inches wide of dug ground and your trench; but you take your spade, and chop down along close to the line, drawing this six inches of ground back towards your trench. This gives you the place for another row of Plants, to be placed

along against the line. You plant this row as you did the first: thus you go on to the end of the piece; and thus your plants are all in the ground; you have dug your ground all over the second time, and you leave a surface untouched by foot, or by any thing to make it hard.

123. By this mode of proceeding you avoid all the trampling that generally takes place in the performing of this work, and you give to your plants the best possible chance of success. As you will have sorted your plants, you will, of course, plant them in assortments; and, therefore, it is necessary to observe, that you may, if you want room, put the smaller sizes at four inches apart in the row, and the rows at fifteen inches, or a foot, apart. This, however, is not worth while, unless you happen to be very much pressed for room. It is to be recollected, however, that, though these plants stand on a very small space in the seed bed, they require room when planted out in the manner above described. Planted in rows, which are at eighteen inches apart, and at six inches from each other in the row, a rod will furnish room for *three hundred and sixty-three* plants, and an acre will furnish room for *fifty-eight thousand and eighty* plants: so that the hundred thousand trees, which, in the seed bed, occupied only ten rods of ground, will now occupy not much short of two acres of ground; that is to say, thirty-two times as much ground as they occupied before.

124. The plants having been thus safely put into a nursery, they remain till they be wanted to go into plantations. Here I have to refer the reader to the general instructions, contained in the former part of this work, where I have (paragraph 40) treated of the seasons and of the weather for planting; of the age and size of the plants, and of preparing their roots for planting (paragraph 48); of the

method of performing the work of planting, (paragraph 75). It will be well for the reader now to go through those paragraphs again: they apply to all trees, and of course it is useless to repeat here the observations which they contain.

125. But, there is to be considered the distance, which plants should be planted from each other, in a plantation; and, it is evident enough that different trees will require different distances. I am now to speak then of the distance at which I would place ASH in a plantation. If the plantation be made with a view to profit, which is the only view which I ought to suppose the planter to have, the trees ought to be planted at very little more, if any, than four feet apart in every direction. If intended for underwood, as the ASH generally is, they may be planted still closer; and, I have often thought, and think still, that a plantation of ASH, the rows only eighteen inches apart, and the plants not more than eight or nine inches apart in the row, would yield an enormous profit, if, in the first place, every other row were taken out, and every other plant in each of the remaining rows; if these were taken out at the end of six or seven years, they would be hoops, and that too, observe of *ground* ASH, as the wood from these seedlings is called. The rest of the trees might remain till they had a growth of ten years, by the end of which time, they would, if properly treated and in pretty good ground, make *hop-poles of twenty-feet long*. So that at the end of ten years from the day of planting, an acre of land would yield *forty-three thousand and sixty hoops*; and *fourteen thousand five hundred and twenty hop-poles*. The hop-poles would be worth on the spot, in any part of England, two pounds the hundred at least; and, in some parts of it, pretty nearly, if not quite, twice that sum. That sum, however,

per hundred would make the acre of ground yield *two hundred and ninety pounds* in poles in the course of the ten years; the price of the hoops varies greatly according to the local situation; but, on an average, they could scarcely be worth less than two pounds a thousand, which makes *eighty-seven pounds more;* and, of course, the total amount of the produce of one acre in the space of ten years, three hundred and seventy-seven pounds. The costs would consist of rent, taxes, fencing, cutting down, and trimming. The labour would very nearly be paid by the faggot wood; and I have no idea of any annual expense for fencing, and for cultivation in the early stages of the plantation, to exceed four or five pounds an acre. In short, I think, I can defy any man to show that all the costs upon the acre, rows eighteen inches apart, and plants six inches apart in the rows, would exceed a hundred pounds in the course of the ten years, including every charge of every description, and allowing the land to be worth a rent of three or four pounds an acre. Here then, in the first ten years, there would be gain greater than can possibly be derived in the ordinary way in the course of four or five times ten years.

126. But, this is not all; for, the poles once cut down, there would come up from the stems another crop; not, I verily believe, equal to the first; but, probably, three times as great as ever was yielded by a common plantation; and, if the near distances of the plants should cause a falling off in the rapidity of the growth, the plantation might be grubbed up; the roots all taken out; it might have a year or two in turnips or other roots, and then be planted with Ash again. If the plantation were in a part of the country where hop-poles were not wanted, the poles would be wanted for other purposes. If let stand till they be twelve, fifteen, or sixteen years old, they would be fit for wheelwrights, and for

many of the numerous uses that Ash timber is applied to. Finally, if you choose that this acre should become a plantation of Ash trees of lofty stature, you have only, when you cut your poles, to leave one standing upon about every ten square feet; and, if these should be found to be in a few years time, too near to each other, you have only, in proportion as they are in danger of becoming too crowded, to cut part of them out. Those that remained, would subdue all the stems that were under them; but still there would be some underwood, and though of an inferior description, would much more than pay all the expenses of keeping the plantation pruned and fenced.

127. In whatever way, however, the plantation be made, and with whatever view, the plants ought to be cut down nearly to the ground, the next year after they have been planted; that is to say, if planted in the fall, or in the spring, they ought to be cut down in the succeeding spring, and in the month of April. If planted in the spring of this year, they ought to be cut down in the month of April next year; and if planted in the last fall, they ought still not to be cut down until they would have been cut down, if they had been planted in the spring. In other words, and for fear of being misunderstood on this point, they ought to have the *growth of one summer*, before they be cut down.

128. As to pruning, very few trees want less of it than the Ash, which naturally grows very straight, sends out no considerable limbs till it gets to the height of twenty or thirty feet, and is very little subject to rot and to grow hollow, from the breaking or the tearing of its branches or limbs. By planting the trees close together, particularly at the first, you insure straightness, and also an absence of side shoots of any size. The plants draw each other up in a

straight form, and, if thinned out gradually and judiciously, they become an uniform and most beautiful plantation.

129. Ash Trees ought always to be felled in winter, and the coppices ought to be cut in the same season. The leaf should be entirely off, before you begin to cut; and though this is a tree that comes out late into leaf, the felling and coppice-cutting ought be finished by the first of March at latest. The bark of the Ash is of no value, and therefore there is no reason for cutting the tree down at the season when Oaks are cut; but the bark of the Ash, and, especially of the young Ash, is, if suffered to remain on, injurious to the wood. As soon, therefore, as convenient, after Ash poles are cut, the bark is taken off in the same manner as that described in the case of the Alder; paragraph 100.

130. I cannot conclude this article, without strongly recommending to my readers to pay great attention to what has been said about this tree. As fuel, its wood is far better than any other tree that we have: its growth is almost the quickest: its various uses are all of importance; and its propagation, cultivation and management, are all nearly as easy as those of a cabbage plant.

131. AMERICAN WHITE ASH: Fraxinus Americana. In all that I have said above, I beg to be understood as having spoken of the Ash generally, and not only of the *English Ash*, being convinced that there are other Ashes much superior to it, in every respect whatsoever; and, of course, more worthy of all that great attention which I have represented it to deserve. This is particularly the case, with regard to the American White Ash, which grows to a greater height than ours, has a more beautiful foliage, grows faster, and produces a timber vastly superior.

MICHAUX says, that it sometimes attains the height of eighty feet, with a diameter of three feet. It abounds, he says, and indeed I have seen it with my own eyes, in the English province of New Brunswick, the centre of which lies about five hundred miles to the north of Boston, in a country covered with snow seven months in the year, leaving us in no doubt at all with regard to its hardiness.

132. This tree is frequently seen with a trunk undivided by any limb to the amount of forty or fifty feet. It is highly esteemed throughout the whole of the United States. It is used in America for most of the purposes for which our ASH is used here. A great deal of it is brought to England in plank; and MICHAUX, in his North American Sylva, says that Mr. ODDY, in his treatise on European commerce, "acknowledges it to be superior, for many purposes, to the COMMON EUROPEAN ASH."

133. If it were extremely difficult to obtain the seeds of this tree, I should not press it upon my readers to plant it in preference to the ENGLISH ASH; because it is in hundreds of thousands that it is wanted; but nothing can be more easy than to obtain the seed. The tree grows in our own province of New Brunswick, and also in Canada. A ship-load of seeds might be collected, with far less trouble than a ship-load of many of those things which are really of no use when they have been brought across the seas.

134. There is this difference, this remarkable difference, between the AMERICAN WHITE ASH and our ENGLISH ASH, namely, that the latter will have, as we have seen above, two years for its seed to come up in, and that the American White Ash will suffer its seed to come up the first year, with just as much ease as an onion or a radish seed. I have

frequently sowed the seeds of this Ash in April, and have had them stand as thick as they could stand upon the ground, though the seeds had been gathered from the tree, in America, in the previous month of November. I do not, however, recommend this practice to any one; for the seeds always ought to be sown, and always may be sown, in February or March, which gives plenty of time for the bringing of them from any part of North America.

135. That this tree grows much faster than ours, I have had abundant proof, and have, indeed, many thousands of proofs now in my possession; for the American White Ash plants which I have at Kensington, and which were not sown till last April, are now full as tall again as any of the English Ash of the same age that I ever saw. This, therefore, is, above all others, the Ash which I recommend to be put into plantations in England, whether for ornament, for timber, or for underwood.

136. AMERICAN BLACK ASH. Fraxinus Sambucifolia. Michaux tells us that this Ash rises to the height of sixty or seventy feet, but that it does not grow to the size of the White Ash. It grows in the same climate, and is used for pretty nearly the same purposes, but is not so much esteemed. The bark of the White Ash corresponds with its name, and so does that of the Black Ash. The first is not, indeed, white, but of a pale grey colour, with a reddish bud; while the bark of the Black Ash has a very dingy hue, and while the buds are black, like those of the buds of our Ash. The leaves of the Black Ash are not much above half the size of those of the White Ash; and there is this further difference between the two trees, namely, that the seeds of the Black Ash, like the seeds of our Ash, will not come up until the second year. I have some

Black Ash at this time. The seeds lay in the ground two years, and the plants are now about the height of those that come from seeds of our Common English Ash.

137. AMERICAN RED ASH. *Fraxinus Tometnosa.*—This is a tree which rises to the height of sixty feet, and is remarkable for growing very straight. Michaux tells us, that the wood is used for the same purposes as those to which the wood of the other Ashes is applied. It is called Red Ash because the bark upon the trunk is of a reddish or deep brown colour, and because the perfect wood is, in the heart of it, of a bright red. Its seeds, being gathered in the autumn, and sown in the spring, come up the first year.

138. AMERICAN BLUE ASH. *Fraxinus Quadrangulata.*—This, as an ornamental tree, is very beautiful. The bark, which is of a brickdust colour, or something approaching it, forms itself in the smaller branches into five ribs or angles; and the seeds, at the butt end, where the kernels lie, are of a bluish colour. According to Michaux, the Blue Ash frequently exceeds in height sixty or seventy feet, but is seldom of great diameter.

139. AMERICAN GREEN ASH. *Fraxinus Viridis.*—This species of Ash differs from all the rest in the form of its seeds, which have no wings, as those of all the rest have. It is a small tree compared to any of the others, and is not in general seen to be above twenty-five or thirty feet high, with a diameter of from four to ten inches. Its name arises, in all probability, from the circumstance of the bark being of a greenish hue, while the bud is of a pale green; and while the seeds have a stripe of green down the middle of each. This tree appears to be known little of in the colder

regions of America; but it appears to be a tree of great beauty, and to be well worthy the attention of those who delight in beautiful plantations.

140. CAROLINIAN ASH. *Fraxinus Platicarpa.*—This, which closes my list of Ash trees, is very distinctly characterized by the form of its seeds, which are much broader, and more flat than those of the seeds of any other sort of Ash. The leaves are much broader than even those of the White Ash; and the colour of its bark is of a greenish yellow; but it rises to a height seldom exceeding thirty feet; and, though a very beautiful tree, is not, as Michaux tells us, esteemed like the other Ashes, for the properties of its wood. Its seeds come up the first year; and it grows very fast while young.

141. I have mentioned all these different sorts of the Ash tree, because many readers may like to be in possession of all of them; but, as subjects for plantations made for profit, I recommend the English Ash, or the American White Ash by preference, when that can be obtained. In all cases, where you are uncertain as to whether the seeds will come up the first year or not, it is the best way to sow them in the spring of the next year, after they have been gathered in the preceding year. If you happen to be late in the season, it is a good way to steep the seeds for two or three days in a tub, in water poured upon the seeds when it is pretty hot; not scalding hot, but rather hotter than you like to bear your hand in. Cover the tub over when you have put in the water; let the seeds remain soaking for about three days and three nights; then sow them, in the manner directed for sowing the seed of the English Ash; break the ground very fine over them, press it down upon them with great care; and, if the weather

be dry, and the sun hot, which sometimes happens in April, cover the beds over in the day-time with mats, until rain or shady weather come, or until the plants come up.

142. An observation which relates to Ash trees in general is this, that the greatest care should be taken to keep cattle out of the young plantations, and out of coppices, where the young shoots are yet low. A hungry cow, or a hungry horse, especially the latter, would destroy an acre in the course of a few days. When once cropped off, they can yield you neither pole nor hoop. The coppice, if cropped all over, would yield you nothing but fagot wood. I therefore beg leave to press upon all those who have young plantations, or recently-cut coppices, the absolute necessity of keeping all sorts of cattle out of them, not forgetting those mischievous vermin, the rabbits, one of which will bark twenty, thirty, or perhaps fifty, young Ash trees in a night. In many cases, valuable coppices have been nearly totally destroyed, or at least a ten years' growth of them has been destroyed by the teeth of the rabbits and the hares, both of them fond of the bark of young trees in general; and this valuable tree, the Ash, happens, unfortunately, to be one of their favourite dishes.

THE BEECH.

In Latin, *Fagus;* in French, *Hêtre.*

143. The Botanical characters are :—It has male and female flowers, on the same tree ; the male flowers are collected into globular heads ; these have no petals, but have several stamina included in an empalement of one leaf, which are terminated by oblong summits. The female flowers have a one-headed empalement, cut into four parts, but have no petals; the germen is fixed to the empalement, supporting three styles, crowned by fixed stigmas. The germen afterwards becomes a roundish capsule, armed with soft spines, opening in three cells, each containing a triangular nut.

144. The BEECH is a tree so well known in England; it is so well known to be one of the loftiest and biggest and hardiest trees that we have; it is, in so many instances, a sort of landmark in the country; its uses are so well known, and the beauty of its foliage, in the fall of the year, has been the theme of so many poets ; that to give any description of its height, bulk, uses, or hue, would be almost an insult to the English reader; I shall, therefore, go at once into those matters which readers, in general, are not well acquainted with.

145. The seed of the BEECH is a nut, contained in a thick and rather prickly husk. This nut is of a triangular shape, and is covered by a double coat, like that of a CHESNUT, from which the kernel differs not very much in taste. These seeds drop from the trees, or are beaten off from them, in the months of October and November. They should be so ripe, as to fall out of the prickly husk or shell of their own accord. When collected together they should be laid in the sun, or hung up in small quantities in bags, in some room where fire is constantly kept, in order that they may become perfectly dry on the outside; but they ought not to continue in

this state for more than a few days; for, if they become *shrivelled*, they perish at once. When the nuts are dry, they should be put into sand that is very fine, and made perfectly dry, putting three bushels of sand to one bushel of Beech Nuts. They must not be in a damp state like the seeds of the Ash; for dampness would rot them in a very short space of time. The Beech-nuts will not grow *if kept over one year.*

146. When the seeds are thus mixed with the sand, they ought to be put into a box or barrel, and kept, if possible, excluded from air. They should be kept thus, until they be sowed; for doing which, the proper time is the month of March, or that of April: the first of April is probably as good a time as any. I should, perhaps, prefer the fall of the year, as in the case of the Ash; but, in this case, there are those mortal enemies, the mice; and though you may kill these gentlemen, or a part of them, revenge is poor work, in such a case: the best way is not to put the nuts into the ground, until you have short nights for the mice to work in, and until nature begin to present them with other dishes to feed upon.

147. When Beech-nuts are picked up from under the trees, you should know whether *hogs* have been at work before you; for if they have, and have had time to do their work completely, they will not have left you, except by mere chance, a single nut that will *grow*, though they may have left many that have a fair outside appearance. The hog's nose is so discriminating, and his scent so fine, that he will discover, by merely putting his nose near the outside coat, or husk, whether the kernel be *sound*, though that kernel has a coat under the outside husk. The safest way is, not to collect the nuts where hogs have been before

you; but if you be, by any accident, compelled to do this, then you ought to *try* the soundness of your nuts before you put them into sand; otherwise you can have no dependence upon them. This work of trying is performed in this manner: you put the nuts into a tub, or some vessel, partly filled with clear water; and all that you find to *swim* are defective to an extent that will prevent them from growing. It is not certain that *all* that sink will grow; but they *generally* will, except in cases where they have been laid in heaps and have *fermented;* for, that will effectually prevent their growing, though they will, if still moist, sink in water. The observations and instructions, contained in this paragraph, apply to chesnuts, walnuts, hickory nuts, and nuts of all kinds, and also to acorns.

148. The SOWING of Beech-nuts is performed in precisely the same manner as that of Ash-seeds, for which see paragraph 109 and onwards. But the Beech-nuts may, and perhaps they ought to be, sown half an inch deeper. As to the time of sowing, it ought not to be *too early;* for, if they lie long in the ground before they begin to spring up, they are food for *mice* all the while; and, even if sown in *March*, you must be careful to kill these depredators if they attack the nuts; for, if they once get into your beds, they make dreadful havock.

149. The MANAGEMENT of the seed-beds, the transplanting of the seedlings into a nursery, the management of them there, the final placing of them in plantations, are all the same as those recommended in the case of the *Ash*. But, the Beech is never planted as *underwood*, it being unfit for poles, hoops, stakes, hurdles, or tool-handles. So that the plantations ought never to be made very thick, as the wood is of little use till it attain a considerable size.

If the trees were planted four or five feet apart, they might be thinned out as they grew up, so as to leave them, at last, from ten to twenty feet apart. In this state they grow to a great height, and form very beautiful woods, especially where the land is chalky, or where there is a light loam with a sandy sort of stone beneath. As to CUTTING DOWN the trees the year after the planting, and as to the PRUNING see first, paragraph 127; and, in this place, *once for all*, I will remark that all DECIDUOUS TREES, ought to be cut down as directed in that paragraph. If intended for underwood, all the shoots that thus come out of the stem ought to remain; but if intended for timber trees, they ought to be kept to *one shoot;* that is to say, all the shoots that come out except one, and that one the strongest, ought to be cut away soon after they come out. It will generally happen, that there will be a piece of the stem sticking out above the point where this shoot comes out. That piece of the stem ought to be pared away with a knife, down to the point where the shoot issues. The shoot will then grow over it, and, at the end of the second year, you will not perceive that there ever has been a cut in the stem. BEECHES, and generally all trees not intended for *underwood*, should be carefully pruned of their *bottom side shoots* as they grow up, taking care always to cut off the shoots close to the stem, and with a sharp knife. You ought to begin pruning in the autumn after the fourth summer's growth, cutting off the lower side shoots, and leaving those of the last three years' growth; and this you ought to continue to do, till you have a clear stem of the length you wish to have it. This is work very easily performed; the whole plantation ought to be gone over regularly, from one end to the other; and the prunings may be tied up in bundles, and will then pay for the expense of the labour.

150. The Beech is always felled in the winter, at least when the leaf is off. The uses of the wood are, boards, parts of wheels, bowls, the wooden part of carpenters' planes, and (when farmers fed their servants in their houses, and when the labourer's cottage knew nothing of the accursed tea and crockery-ware) *trenchers*. This wood is, by cleanly people, generally chosen for dressers, and for shelves in milk-houses; for churns, cheese-vats, and the like, it being white as deal, without its disagreeable smell, and without its inconvenient softness.

151. AMERICAN BEECHES.—There are two of these: 1. The Red Beech (*Fagus Ferrugina*); 2. The White Beech (*Fagus Sylvestris*). These differ from each other in the colour of the bark, and in the size, and a little in the shape, of the leaf. I have seen trees of both sorts very lofty and big; but I have always understood, that the grain of the wood is not so fine as that of our own Beech.

THE BIRCH.

In Latin, *Betula;* in French, *Bouleau.*

152. The Botanical characters are the same, in all respects, as those of The Alder, which see in paragraph 93.

153. Of American Birches there are no less than five distinct varieties; but, as the instructions applicable to the English Birch apply equally well to all these, I shall, under this first head, give all the instructions that I think necessary, relative to this kind of tree.

154. The Birch is, in this country, seldom a large tree,

or a lofty one, though, if desirable, it might, doubtless, be made to become both large and lofty. But, *as timber*, it yields the superiority to so many others, and, as *underwood*, to so few, that it is seldom (unless for mere ornament) cultivated, except in the latter character. Many, however, are its good qualities. Its chief uses are in hoops and brooms, though its wood, when sufficiently large, might be applied to some of the uses to which the wood of the Alder is put. The Birch makes but a poor hop-pole; and, as a stake, it will hardly stand a year. In quality it is inferior to the Hazel in hoops, in hurdles, in rods; but it grows a great deal faster, more straight, and produces a much more abundant crop. It will, too, not only *grow*, but thrive, in any soil or situation, and does, in this respect, far surpass all other trees. It will flourish on the top of a bank of pure sand or gravel, and it will also flourish in a bog. It is the first tree in leaf in the spring; and, where it abounds, its verdure, which is peculiarly gay, glads the eye more than ten days before the buds have begun to send forth green from the other sorts of underwood.

155. The SEED of the Birch resembles, in all respects, that of the Alder, for a description of which, and for directions as to the collecting and preserving the seed, see paragraphs 96 and 97; only I may add here, that the seed of the Birch and of the Alder, will, if kept constantly dry, keep good for several years.

156. But as to the SOWING of these seeds, the directions are here to be given, and these are to serve also for sowing the seeds of the Alder. The seed is a very minute flat thing, surrounded by a sort of web, or wing; and, unless great pains be bestowed, it will not come up. I took, for several successive years, infinite pains to raise American

Birches from seed, and I always failed. Miller had taught me, that I must cover the seed *very lightly;* but though I did this with earth passed through a sieve that made it as fine as flour, I got, on an average, not a plant in a yard square, though I sowed in the shade, and watered, and neglected no precaution tending to success.

157. The Birch does not send out *suckers;* and, as it cannot be propagated by *cuttings*, like the Alder, the young plants, wherewith to make new plantations, are got *from the woods;* are pulled up there when young, and are put into plantations at once, or are previously placed in a nursery for a short time. In the birch-woods abundance of seeds fall every year, and are of course never covered by any earth at all. They must generally fall upon, or amongst, leaves; but some few remain on the bare ground. Here, in the shade of summer, they strike; and they barely exist in this shaded state, *until the coppice be cut.* Then they have sun and air; and while the old stems are sending up their new shoots, these seedlings get up too; and before they be completely overtopped again, they become plants a foot or two high. They, when they become shaded again, make little progress in height, but increase something in size of stem. When the wood is *next cut*, the hook sweeps them down amongst the rest, and then they send up strong shoots; they start with the old stems, and take their place as underwood.

158. The last summer (1827), having failed in all my attempts to raise plants from American seed, I, reflecting on this operation in the woods, determined to try some seed *on the top of the ground, and under shade.* In order to insure the shade and the moisture, and, at the same time, to insure protection against heavy rains and gusts of wind,

I prepared some ground, on which I put cucumber-frames; and, in these frames, the bed of earth having been sifted very finely, I sowed my seed in the following manner:—I first put it into *warm water*, and let it soak for forty-eight hours: I then mixed it well and truly with earth very finely sifted, making the whole rather *wet*. I laid the mixture in a heap, which I turned every day for about four or five days, until I saw here and there a seed beginning to throw out its root. I then took the mixture, and scattered it (seed and earth together) on the beds that I had prepared, gently watering the bed, and shading it with a mat, giving air in the day-time, and, when no rain or wind threatened, taking off all covering during the night.

159. In about a week, I saw the seeds, which lay on the top of the ground, beginning to send out their roots, and to send them down into the ground. As the root descended, the seed rose up from the ground; and at the end of about four days, it was most curious, and, to me, most delightful, to behold, the whole bed covered with the little brown seeds standing up, sustained by the root. In about four days more, the leaves "shuffled off the mortal coil," and the bed was all one beautiful green.

160. It was pretty nearly *July* before I resorted to this method, so that the plants were still very small, when overtaken by *Autumn*, and, of course, too small for sale this year; but, by one transplanting, they will be made very fine plants. After the plants become green, you must still continue to shade under a hot sun, until they be fairly out in rough leaf; but when they arrive at that point, they are safe.

161. Here is a great deal of nicety and attention required;

but consider, that a cucumber-frame, of three or four lights, will give you from *ten to twenty thousand trees*, with as much certainty as you can have any plant of any kind. From the seed-bed the plants go into a nursery, where they are treated in precisely the same manner as directed for treating the seedlings of the Ash.

162. For the want of knowing how to manage the seed-beds of this tree, recourse is had to the coppices; and I venture to say, that one thousand plants obtained in that way, must, on an average of cases, cost as much as the raising of ten thousand, in the manner above directed; besides that the plants from the coppices must necessarily be poor scrubby things compared with those raised in beds.

163. The PLANTING OUT of the Birch is performed in precisely the same way as that directed in the case of the Ash. Four feet each way is quite thick enough; and the produce, if the plantation be duly attended to, is very great; for the shoots of the Birch grow erect; great numbers come out of a stem; they grow fast; and they suffer from nothing but actually cropping or breaking off.

164. As to FELLING, the Birch, like all other underwoods, is cut when the leaf is off. The finer spray is selected for brooms; the straight rods for barrel hoops, or hurdles; the short and stout and straight parts, for broom handles; and the rough stuff for fagots, or fuel, in some shape or other. The better the ground, the faster the shoots will grow, and the sooner they will be fit to cut; but the Birch ought not to stand till it become *poles;* for, as such, it is good for very little. Where there is Birch, there ought, in the same underwood, to be *nothing but Birch;* because, if with Hazel, for instance, it ought to be cut sooner than the Hazel, and

this cannot be, for all must stand or be felled *together;* so that, where there is a mixture, the Birch, waiting for the Hazel, gets to be too big before it be cut: it is a pole, by the time that the Hazel becomes a rod. In the case of the *Ash*, the mixture does no harm; for, though it outstrips every thing of English underwood, it is useful in *all* its stages; and the bigger it is the more it is valuable.

165. I have here been speaking only of the *English Birch;* but the thing to be desired is, a general introduction of the *American Birches.* As to their seed, their propagation, their cultivation, and their application, they have nothing different from ours. They are equally hardy too, and equally regardless of soil and situation. But they grow still faster than ours; they exceed ours in straightness; and they all *grow to trees,* like an Oak or an Ash. Miller strongly recommends them in preference to our own; and, as his book was published more than half a century back, and as it was, and is, a book of great repute, the reason of his advice having been neglected, is to be found, doubtless, *in difficulty of raising plants from the seed,* a difficulty which my successful experience has now completely removed.

166. The American Birches are, 1. The White Birch (*Betula Populifolia*); 2. The Black Birch (*Betula Lenta*); 3. The Red Birch (*Betula Rubra*); 4. The Yellow Birch (*Betula Lutea*); 5. The Canoe-Birch *Betula Papyracea.* Of the size of these trees, the reader may judge from the *name* of the latter, which has been given to it because the Indians make their *canoes* with the bark of it, by taking off the bark, *in one whole piece,* and making a canoe of it, sometimes sufficient to carry, very conveniently, ten or twelve persons. Nothing can be easier than the importing of the seeds of these trees, which grow in great quantities

in all Northern parts of the United States, in Canada, New Brunswick, and Nova Scotia. The katkins are collected when ripe, made very dry, and may be brought to England in barrels, or bags; and as the seed, if kept in a dry state, will be as good at the end of two years as at the end of one year, it may be brought to England at any time of the year, and safely kept till the suitable occasion for sowing arrive.

CEDAR.

In Latin, *Juniperus;* in French, *Cedre.*

167. The botanical characters are: It has male and female flowers in different plants, and sometimes at separate distances on the same plant. The male flowers grow on a conical katkin; the flowers are placed by threes, two of them fastened along the common tail opposite, terminated by a single one; the scales are broad, short, lying over each other, and fixed to the column by a very short foot-stalk. The flower has no petal, but three stamina in the male flower, which are joined in one body below, having three distinct summits, adhering to the scales of the lateral flowers. The female flowers have a small three-pointed empalement, sitting upon the germen, which is permanent; they have three stiff, acute, permanent petals; the germen sitting below the empalement, supports three single styles, crowned by stigmas. The germen afterwards becomes a roundish berry, inclosing three stony seeds, which are oblong and angular on one side, but convex on the other.

168. Miller reckons *thirteen* varieties of the Cedar; but, as I am to treat of only such trees as are fit for *forests*, or *woods*, I shall mention but two: the RED CEDAR and the WHITE CEDAR; both suited to our climate, both hardy, both of great utility, and both *thriving* upon lands (the one on the dry and arid, and the other on the very wet), where hardly any other tree will even *live*. Lofty evergreens are, above all other trees, wanted in England;

and these two trees, besides their other numerous valuable qualities, give us this thing which is so desirable.

169. Concerning the RED CEDAR (*Juniperus Virginiana*), I will first give what Michaux, in his American Sylva, says upon the subject; and then I will give an account of my own experience in the raising of the plants.

170. "The foliage is evergreen, numerously subdivided, "and composed of small sharp scales enchased in one "another. It diffuses a resinous aromatic odour when "bruised; dried and reduced to powder, it has the same "effect as the common Juniper, of increasing the "efficacy of blistering plasters. The male and female "flowers are small, not conspicuous, and borne separately "on the same or on different stocks. The seeds are small "ovate berries, bluish when ripe, and covered with a "white exudation. They arrive at maturity about the "beginning of the fall, and, if sown immediately, the "greater part of them shoot the following spring, but not "before the second year, if they are kept several months. "The quantity of gin made from them in the United States "is small, compared with what is imported from Holland. "The name of Red Cedar is descriptive only of the per-"fect wood, which is of a bright tint; the sap is perfectly "white. The most striking peculiarity in the vegetation "of the Red Cedar is, that its branches, which are nume-"rous and close, spring near the earth, and spread hori-"zontally, and that the lower limbs are, during many "years, as long as the body of the tree. The trunk de-"creases so rapidly, that the largest stocks rarely afford "timber for ship-building, of more than eleven feet in "length. Its diameter is very much diminished by deep

" oblong crevices in every part of the trunk, which are " occasioned by the large branches persisting after they are " dead. My own observations and experiments lead me " to believe that the growth of the tree might be quick- " ened, and this deformity prevented, by cutting the limbs " even with the trunk for two-thirds of its height. The " wood is odorous, compact, fine-grained, and very light, " though heavier and stronger than that of the White " Cedar and Cypress. To these qualities it unites the " still more precious character of durability, and is con- " sequently highly esteemed for such objects as require it " in an eminent degree. But as it is procured with diffi- " culty, and is every day becoming scarcer, it is reserved " exclusively for the most important uses. The reproduc- " tion is too trifling to be mentioned in comparison with " the consumption in the ports of the United States at " large, and particularly at New York, Philadelphia, and " Baltimore. In the upper part of the frame of vessels it " is joined with the Live Oak, to compensate its excessive " weight; and this usage, more than any other, has wasted " the species. Recourse is now had to the coast of East " Florida, between the St. Mary and the St. John, which " will soon be exhausted in its turn. The nearer the Red " Cedar grows to the sea, and the farther southward, the " better is its wood. Next to ship-building, it is most " commonly used for posts, which are highly esteemed, " and are reserved for inclosing court-yards and gardens in " the cities and their vicinity. The barriers of the side- " walks, in the streets of Philadelphia, are made of this " wood: they are ten or eleven feet long, and eight inches " in diameter, and are sold at eighty cents each, while those " of White Cedar cost only sixteen or seventeen cents. It " is eminently fitted for subterranean water-pipes, but is " rarely employed, from the difficulty of obtaining stocks of

" a sufficient diameter. Small round or oval tubs, very " neatly wrought and hooped with brass, are made with " staves consisting partly of the sap and partly of the " heart. I have observed that the turners at Philadelphia " make the large stop-cocks of this wood. In the southern " states it is commonly chosen for coffins."

171. I have imported the berries of this Cedar. They are about the size of a common field pea; each contains three hard seeds, the three being covered with a resinous pulp. I sowed a parcel in March, 1826, and they came up early in March, 1827, having been sent from America in the early part of 1826, in a barrel, in which they were mixed with dry sand. They were sowed in the manner that I have directed for the sowing of the Ash. They ought to stand *another year in the seed-bed*, and, after a year, or two at most, in nursery (put in in the manner directed for the Ash), they might go into plantations. But, at every stage, great care ought to be taken in *removing* them. The same may be observed of all *evergreens;* for they all transplant with more risk than diciduous trees.—See, as to *transplanting* and *pruning of roots*, paragraph 215, which must be *particularly attended to.*

172. The Red Cedar is surpassed by no wood in *lightness*, and yet it yields not even to the Locust or the Live-Oak in *durability*. Many are the instances, in Long Island, where you see *posts* of this wood that must have stood for a century or more, though exposed to the weather all the while. These trees grow on the very *barrenest* and most exposed parts of the coast, where no other trees will even live. In winter time, in many parts of that country, their boughs are a great resourse for the feeding of ewes that have lambs, in the absence of all other green or moist food.

This is so much the case, that the CHANCELLOR LIVINGSTON (ambassador in France about twenty years ago), in a book which he wrote on the management of sheep, has a long passage upon this species of sheep-food; which, indeed, I used to thus apply myself, and with very great success. These trees would thrive on any of the poorest of our hills of chalk, of sand, of gravel, or of rock. Nothing can be easier to raise, and nothing more easily to be obtained than the seed.

173. WHITE CEDAR (*Cupressus Thyoïdes*).—This tree, which appears to have been unknown to Miller, would seem to be something half way between a *Cedar* and a *Cypress;* for it does not bring its seed in a *berry*, after the manner of the Cedar, but in a little dry *cone*, not larger than a marrow-fat pea; but, while it has *three* seeds in each cone, the cone is not, like that of the Deciduous Cypress, globular, but has *little squares* imprinted upon its surface. The cone is so compact, that, unless *quite ripe*, you must actually thump it with something hard and heavy to get out the seeds; but, if ripe, or nearly so, and laid in a warm sun, or near a fire, the cones will open and the seed come out.

174. The SOWING ought to take place as soon after you get the seeds (in the fall or winter) as the ground can be made to work. The manner of sowing is that of the RED CEDAR, except that these seeds must not have more than *an inch* of covering. These seeds also do not come up till the second year; the plants are to be treated, in all their stages, like those of the Red Cedar. But pay further *particular attention* to paragraph 215.

175. But, as to *soil* and *situation*, this tree wholly differs from the Red Cedar; for this tree loves wet land, and even

a *swamp;* and not only a swamp, but a swamp *covered by every spring-tide,* even where the water is *saltish;* a thing that agrees with no other tree that I know of: for even the *Alder* will not live if frequently visited by water that is what is called *brackish.* In the account which I am about to give from Michaux, a good deal is said about the height, size, and uses of this most valuable and beautiful tree; to which I will just add, that it covers, in the shape of *shingles,* almost all the good houses in the United States: painted, this covering will last a hundred years; and, unpainted, thirty-five or forty. The tree is straight as a gun-stick, and it has all the other characteristics of beauty. The seed is easily obtained; and how many now worthless moors and morasses, in this kingdom, might, at a very moderate expense, be covered with woods of this valuable timber!

176. What Michaux says of this tree is as follows:— "The White Cedar grows only in wet grounds. In the "maritime districts of New Jersey, Maryland, and Vir- "ginia, it nearly fills the extensive marshes which lie "adjacent to the salt-meadows, and are exposed in high "tides to be overflowed by the sea. In New Jersey it "covers almost alone the whole surface of the swamps, of "which the Tupelo and Red Maple occupy the skirts. "Farther south it is mingled with the Cypress, by which it "is at length entirely supplanted. In Lower Jersey and "Maryland the swamps are accessible only during the "dryest part of the summer, and when they are frozen in "the winter. The trees stand so thick in them, that the "light can hardly penetrate the foliage; and in their "gloomy shade spring, at every step, tufts of the Dwarf "Rose Bay, Honeysuckle, and Andromeda. The luxuriant "vegetation proves that they delight in dark and humid

" exposures. The White Cedar is seventy or eighty feet
" high, and rarely more than three feet in diameter, unless
" perhaps in the great swamps which have not been tho-
" roughly explored, such as the Dismal Swamp near Nor-
" folk, in Virginia, which is covered with this species and
" the Cypress. When the White Cedars are close and
" compressed, the trunk is straight, perpendicular, and
" destitute of branches to the height of fifty or sixty feet:
" they are observed to choose the centre of the swamps,
" and the Cypresses the circumference. The epidermis is
" very thin on the young stocks; but, as they grow older,
" it becomes thick, of a soft filaceous texture, of a reddish
" colour, and similar to that of an old Vine. When cut, a
" yellow transparent resin, of an agreeable odour, exudes,
" of which a few ounces could hardly be collected in a
" summer from a tree of three feet in circumference. The
" foliage is evergreen; each leaf is a little branch, nume-
" rously subdivided, and composed of small, acute, imbri-
" cated scales, on the back of which a minute gland is dis-
" cerned with the lens. In the angle of these ramifications
" grow the flowers, which are scarcely visible, and which
" produce very small rugged cones of a greenish tint, which
" changes to bluish towards the fall, when they open to
" release the fine seeds. The concentrical circles are
" always perfectly distinct, even in stocks of considerable
" size, but their number and compactness prove that the
" tree arrives at its full growth only after a long lapse of
" years. I have counted 277 annual layers in a trunk
" twenty-one inches in diameter, and five feet from the
" ground, and forty-seven in a plant only eight inches thick
" at the surface, which proved it to be already fifty years
" old. I was told that the swamp in which it grew had
" been burnt at least half a century before, and had been
" repeopled from a few stocks that escaped the conflagra-

" tion, or perhaps by the seeds of the preceding year. The " wood is light, soft, fine-grained, and easily wrought. " When perfectly seasoned, and exposed for some time to " the light, it is of a rosy hue. It has a strong aromatic " odour, which it preserves as long as it is guarded from " humidity. The perfect wood resists the succession of " dryness and moisture longer than that of any other spe- " cies; and for this quality principally, as well as its ex- " treme lightness, it is preferred at Baltimore and Phila- " delphia for shingles, which are cut transversely to the " concentrical circles, and not parallel, like those of the " Cypress. They are from twenty-four to twenty-seven " inches long, from four to six inches broad, and three lines " thick at the larger end. In the advertisements of Balti- " more they are called Juniper Shingles, and are sold at " four or five dollars a thousand. At Philadelphia and " Baltimore they are generally preferred to those of Cy- " press, as they are larger and are free from the defects of " splitting when nailed upon the rafters. The houses in " those cities, as well as in New York and the smaller cir- " cumjacent towns, are covered with them; they usually " last thirty or thirty-five years. The domestic consump- " tion is great, and the exportation to the West Indies is " estimated at several millions. The White Cedar has " long ceased to be employed for the frames of houses: " stocks of sufficient dimensions are rare, and are more " profitably reserved for shingles and for other works of " joinery, for which this species is superior to the White " Pine, being still more durable and more secure from " worms. It continues to be used in building only near " the great swamps, in which it abounds, as about Greategg " Harbour and Indian River in New Jersey, and near the " Dismal Swamp in Virginia. The superior fitness of this " wood for various household utensils has given rise, in

" Philadelphia, to a distinct class of mechanics called Cedar " Coopers, and a great number of workmen are employed " for the domestic and foreign market. They fabricate, " principally, pails, washtubs, and churns, of different " forms. This ware is cheap, light, and neatly made; and " instead of becoming dull, like that of other wood, it grows " whiter and smoother by use. The hoops are made of " young Cedars, stripped of the bark and split into two " parts. The saplings are appropriated exclusively to this " object, and vary in price from five to fifteen dollars a " thousand, according to their length: the largest are two " inches thick at the base, and eleven or twelve feet long. " At the mouth of the river Cape Fear, the pilots and fisher- " men cover the sides of their boats with clap-boards of " White Cedar, which they prefer to those of Cypress, as " being lighter, more durable, and less liable to split. I " have been assured that this wood, selected with care, " makes excellent sound-boards for forte-pianos. The " merchants of Philadelphia find it best for preserving oils. " Charcoal, highly esteemed in the manufactory of gunpow- " der, is made of young stocks about an inch and a half in " diameter, deprived of their bark; and the seasoned wood " affords beautiful lamp-black, lighter and more intensely " coloured, though less abundant, than that obtained from " the Pine. In the lumber-yards of Philadelphia, White " Cedar boards from New Jersey, ten or twelve feet long, " and of a mean breadth less than thirteen inches, are sold " at twenty dollars a thousand feet. In New Jersey, not far " from Philadelphia, the farmers on the borders of the " Cedar Swamp employ this tree for field-fence: the rails, " formed of young stocks, entire or split in the middle, last " from fifty to sixty years when deprived of the bark: they " are sold at six or eight dollars a hundred, and the stocks " proper for posts at twelve or fifteen cents a-piece.

"Swamps which produce the White Cedar are a valuable "species of property, and might be rendered more profit- "able by more judicious management."

THE CHERRY.

In Latin, *Cerasus;* in French, *Cerisier.*

177. The Botanical characters are:—The flower has a bell-shaped empalement of one leaf, cut into five parts; it has five round large petals, which spread open, and are inserted in the empalement; and from twenty to thirty stamina, which are nearly as long as the petals, and are also inserted in the empalement, terminated by twin summits. It has a roundish germen, supporting a slender style, crowned by an orbicular stigma. The germen turns afterwards to a roundish fruit, enclosing a nut of the same form.

178. I am not about to speak of the *fruit*-trees of this species; but solely of those trees which are useful as timber, and these are *three* in number; 1. Our native *wild cherry;* the *American wild red cherry,* and the American wild *black cherry.*

179. The ENGLISH WILD CHERRY tree, which bears a little blackish and sometimes reddish fruit, will grow to a great size; it grows fast; its trunk is very straight, and its timber is pretty good; being better, at any rate, than that of the Beech, or of the Elm, for boards; and, indeed, it is not amiss for the making of furniture, being of a reddish colour, compact, and admitting of a fine polish. As *underwood,* it is not good; in poles, it is of bad shape; and nothing like equal to the Ash in quality. It is wholly unfit for hoops, hurdles, stakes, or any other of the most profitable uses of underwood. If stems of it be met with in our coppices, I have always seen their produce cut up

The wood of this tree is beautiful in household furniture: it is of a light brick colour, very hard, very durable, and admits of as fine a polish as mahogany; and is, whether in tables, chairs, bedsteads, or any other thing, much more beautiful. It is a fast-growing tree; its leaves are long, smooth, and of a very bright green; and, as a flowering tree, it yields to scarcely any.

188. The SEED of this tree is a little oblong cherry-stone, which, as to collecting, preserving, and sowing, is to be treated precisely like the stones of our wild cherry. The Americans gather the fruit for the making of *cherry-rum*, or *brandy*, for which purpose it is preferred to the common black cherry, which we call *Merries*, that being a corruption of the Norman term *Merise*. But, though this tree is as hardy as any other of the Cherry kind, thriving as it does, even on the sea coast, in the Northern parts of the United States; and, though it will blow very finely in England, its seed never does, I believe, ripen here, and must therefore be obtained from America, as it easily may, making a barrel supply the place of the shed, or the cellar, for keeping the seed till the sowing season arrive.

189. These trees, when they come out of the nursery, ought to be put into plantations, at four feet apart; for, in that situation, they will grow erect, which they are apt, sometimes, not to do, if they have room to straggle. They ought to be kept pruned up, as directed in the case of the other Cherries, in paragraph 183. As to *cutting down* the year after planting, see paragraphs 127 and 149.

THE CHESNUT.

In Latin, *Castanea;* in French, *Châtaignier.*

190. The Botanical characters are :—It has male and female flowers on the same tree, sometimes at separate distances, and, at other times, near each other. The male flowers are fixed to a long string, forming a sort of kat-kin; these have each an empalement of one leaf, cut into five parts; they have no petals, but include about ten or twelve bristly stamina, terminated by oblong summits. The female flowers have also an empalement of one leaf, divided into four parts, having no petals, but a germen fixed to the empalement, supports three styles, crowned by a reflexed stigma. The germen, which is situated at the base of the empalement, becomes a roundish fruit, armed with soft spines, including one or more nuts.

191. There are divers sorts of Chesnuts; but I need mention only two of these sorts, these being the only ones fit for timber trees or underwood; namely, the SPANISH CHESNUT and the AMERICAN CHESNUT. There are, indeed, divers varieties of what we call the Horse Chesnuts; and as our Horse Chesnut always will be cultivated more or less, I shall speak of that bye-and-bye.

192. THE SPANISH CHESNUT.—This is a tree not remarkable for great height; but it comes to a considerable size, and its timber is thought to be, in many respects, equal to that of our Oak. There are indubitable signs of its having been a tree much cultivated in England in former times :—the roofing of Westminster Hall is said to consist of Chesnut wood, which is also to be found in almost all of those gentlemen's mansion-houses, such great numbers of which existed in England formerly, and so very few of which the Protestant Reformation, aided so materially by the loaning and funding and paper-money system, has left

standing in any part of the kingdom. This tree has, however, been supplanted by the Oak, as *timber;* but as *underwood* it is excellent, while the Oak, as underwood, is really good for nothing, except for fuel; and, even as fuel, it yields to almost every other tree, until the wood be of a considerable size.

193. The SEED of the Chesnut is to be collected, preserved, and sowed, in precisely the same manner as directed for the seed of the BEECH, to which the reader will be pleased to turn back; but the seed of the Chesnut is much more delicate than that of the Beech, and maggots are much more apt to get into it. These insects have the perverseness to prefer the *germ* of the seed to all other parts of it; the moment they enter they begin upon the germ, and the moment they begin upon it they destroy the vegetative faculty of the seed. Therefore, if you collect your own seed, the greatest possible care must be taken to make it perfectly dry as soon as possible; not to put it into large parcels; you ought to turn it and rub it several times in order to destroy the eggs from which the maggots come. When the seed is *perfectly dry*, made so in the sun, if possible, it ought to be packed in jars or barrels, along with very dry sand, four times as much sand as chesnuts, and duly mixed; and then the jars or barrels ought to be closed down as carefully as if containing currant-jelly or choice pickled pork.

194. The SOWING ought not to take place until towards the end of March or the beginning of April. The manner of sowing is that described in the case of the BEECH. The earth should be very finely broken, and the seeds, after being scattered over the beds, ought to be well pressed down by the back of the spade, in order that they may not

become exposed by the washings of heavy rains. They come up in the month of May, and they get, by the month of October, to be about six or seven inches high, with leaves pretty nearly as large as those of the old tree.

195. If the seeds be *imported*, you run great risks; for they may have been put into an oven, in order to prevent their heating on the voyage; and, nine times out of ten, that will destroy the *germ*, though the nut may still be very good for eating. If the nuts have been put in heaps, or packages, and have at all *fermented*, they will not grow. I received several barrels, three years ago, in a very fine state, mixed with sand, perfectly dry. In order to put them in a state of greater security, I deemed it advisable to lay them in a heap in the garden, separated from their sand, and covered over with a foot thick of mould. My ground was not ready, and I feared that they would get *too dry* before I could conveniently sow them. But, deprived of their sand, and being put together in a heap, the moisture that remained in them caused them to *heat* and to *mould*. I examined the germs of them, and found them all rotten. I sowed them, however, but had not one single plant, when I ought to have had twenty, or perhaps fifty, thousand; and I have invariably found, that if seed, no matter of what sort, once ferment, be it ever so little, it will not grow. This is almost always the case with acorns that have to be conveyed from one place to the other; and it is for this reason that they ought always to be made very dry; and, for fear of their becoming *withered*, and the destruction of the germ produced this way, they ought always to be packed in very dry sand.

196. As to the TRANSPLANTING from the seed-bed to the nursery, and from the nursery to the plantation,

follow, in all respects, the directions given in the case of the Ash. If Chesnuts be intended for timber, they ought to be planted in rows of four feet apart, and at four feet apart in the row, the plants in one row standing opposite the middle of the intervals in the other row, which indeed ought to be the case in the planting of all other trees. As to managing the ground of the plantation, follow the rules laid down in the case of the Ash; and as to *cutting* down the plants the year after they are planted, and also as to *pruning*, see paragraphs 127 and 149.

197. When UNDERWOOD is the object in a plantation of Chesnuts, the rows ought to be five feet apart at the least, and the plants five feet apart in the row. The Chesnut stem spreads wider and requires more room than that of the Birch, the Hazel, or even of the Ash. As underwood, the Chesnut is useful, chiefly as *poles*, of which it produces very good ones, lasting as long or longer, as hop-poles, than the Ash; but it does not grow so fast as the Ash, and, unless great care be taken, has some disadvantages unknown to the Ash. It sends out stout side-shoots, coming opposite each other; and this makes a great swell in the middle of the pole, and causes the upper part of the pole to diminish in size too rapidly. Then, to get a Chesnut pole any where between twelve and twenty feet in length, there will always be a *disproportionate butt*; the butt will be too large in proportion to the top of the pole. This, in hop-poles, for which purpose Chesnuts are generally employed, is a disadvantage that none but skilful hop-planters can know of. The bine of the hop (and it is the same with all other climbing plants) do not like to have a big thing to go round at starting. The *reason* of this I do not very well know; but of the *fact* I am quite sure. I suppose the reason to be that, in going round so large a thing, the

point of the bine is kept, at certain times, too long from the sun. At any rate, such is the fact; and, if you take two hop-bines coming out of the same hill, and out of the same plant, and being exactly of the same age and strength, and put one to a pole which is three inches through, and another to a pole which is two inches through, you will see the latter not only mount a great deal faster than the former, but be, and continue to be throughout the summer, much more vigorous, and finally to produce a better crop. This fact is well known to all intelligent hop-planters, some of whom, in order to obviate the injury arising from large-butted poles, stick in little rods as leaders, to conduct the bine to the pole, at two or three feet from the ground.

198. For this reason the CHESNUT Poles ought to be so managed, as to be kept as small as possible at the butt. This object is best insured by crowding, by pruning the side shoots, and by thus sending the sap towards the top of the plant. No body prunes underwood; but it would pay very well, especially in the case of the CHESNUT. As many shoots as come out, ought to be left to grow from the stem, which naturally tend to diminish the size of the butts; while taking off the side shoots, to six or seven feet from the ground, would cause the top of the pole to be stouter in proportion to the bottom. When CHESNUT coppices are cut down, the cutting, as mentioned in the case of the ASH, and is to be understood with regard to all other underwoods, ought to be as close to the ground as possible, and always with an upward, and not with a downward, stroke of the hook or axe.

199. AMERICAN CHESNUT.—This is far more lofty than I have ever seen any of the SPANISH CHESNUTS. It frequently rises to the height of a hundred feet; and I have

seen four trunks coming out of one old stem, which had been the support of a very large tree, each of the four measuring more than a hundred feet in length, and that, too, in very poor but light land; and I must here observe, which perhaps I ought to have done before, that the CHESNUT does not like *wet land*. The better the ground, doubtless, the faster the growth; but CHESNUTS will thrive very well in poor dry land.

200. The seed of the AMERICAN CHESNUT is not much more than a fourth part of the size of the SPANISH CHESNUT, but it is sweeter in flavour. The timber is equally good, and the American is much the best for underwood, being of faster growth, and in its nature so much taller, and so much less prone to be stouter at the butt in proportion to the summit. To collect and send the seeds from America is somewhat expensive; but the superiority of the plant over the SPANISH CHESNUT is more than a sufficient inducement to planters to encounter this expense.

201. As to the sowing of the seeds, the management of them in the seed-bed, the removal of them into the nursery, and the final transplantion to the spot where they are to stand, the directions just given with regard to the Spanish Chesnut, all strictly apply; but I think that *four feet* distances, in the planting of underwoods with these, would be quite sufficient. They grow more erect than the others; they do not require so much room; they are apt to throw out a less number of, and smaller, side shoots; therefore a greater number of stems might stand upon the same space of ground. The age at which a Chesnut Coppice ought to be cut, must, of course, depend upon the growth, and the growth upon the nature of the soil; but I am clearly of opinion, that the AMERICAN CHESNUT would require a year

or two less of growth, to make hop-poles, than the Spanish Chesnut, planted on the same spot. With regard to the *cutting down* of the plants, the next year after they are planted out, and with regard to the pruning of them for timber-trees, see paragraphs 127 and 149.

202. Chesnut (Horse). This tree, which is sometimes very large and very lofty, and though the timber of it is poor, the leaf coarse, and soon becoming brown in the summer, and though the tree will never be cultivated for profit, it is certainly one of the finest flowering trees in the world. There are several varieties of it, in several parts of the world. There are two distinct sorts in America, one having a scarlet, and the other a yellow blossom; but these not being fit for forest-trees in England, and being, in fact, mere ornamental shrubs, or trees, I shall not notice them here. The seed of the Horse Chesnut is collected in the fall of the year, when the outside shell opens and lets it out. The seed is preserved in the same manner, sown in the same manner (only covered a little deeper), and the plants are treated, in all their stages, in the same manner as above directed for the Spanish Chesnut, except only that the plants of this tree are naturally so stout at the butt, and suffer so little from transplanting, that they need not be cut down the second year. If, however, you wish for a straight trunk, you must plant the tree after it has been a year or two removed into the nursery; and if you wish for a clean and long trunk, you must prune in the manner directed in paragraphs 127 and 149.

THE CRAB.

In Latin, *Malus;* in French, *Pommier Sauvage.*

203. The Botanical characters are:—The empalement of the flower is of one leaf, cut into five segments. The flower consists of five leaves, which expand in the form of a rose, the tails of which are inserted in the empalement. The fruit, which is hollowed about the foot-stalk, is for the most part roundish, and umbellated at the top; it is fleshy, and divided into five cells or partitions, in each of which is one oblong seed.

204. I am not about to recommend the planting, to any extent, of this tree; but I notice it, because it is found in all our woods, and because there are certain uses to which it is put. The timber, which seldom attains a considerable size, is excellent for the cogs of mill-wheels, for heads of beetles, and for some other purposes, where the quality of not being apt to split is required. As an *underwood*, it is mere fuel, except for the making of walking-sticks and clubs, in which capacities, especially when stout, it is proverbially efficient. Allied to these functions is that, certainly more useful, of its super-excellence in the making of what the thrashers call the *swingles* of flails, it being capable of wearing the stoutest man out, if he ply it well, and during those parts of the year when there is thrashing to do. In *Hedges*, it is very beautiful in the spring, and also in independent trees; for, in the month of May, it is a great bush, or a little tree, covered with blossoms as bright as those of the Carnation, and a great deal larger. When the coppices are cut, the Crabs, if they go up in a single stem, are generally left as the Oaks are; and, in the month of May, the garlands presented by the Crab trees, while the Primroses bespangle the ground beneath, and while the birds are singing all around, certainly give us, altogether,

something more delightful than almost any thing else accessible to our senses.

205. But, as a *Hedge*, the Crab is too rugged; its wood becomes quickly too big; there come openings at the bottom, and the fence is not effectual for many of its purposes. But if a Crab-plant were put in a Hawthorn hedge, along with the Hawthorn-plants, and at every twenty or thirty feet distance, and trained up to a single stem, and then left to get a head, the bottom part of which should be about two feet clear of the top of the hedge, the Crabs would not injure the hedge, and would produce a very charming effect.

206. The SEED of the Crab is precisely like that of the Apple; and I am sure the reader has eaten too many apples not to know what sort of things they are. To get these seeds in order to sow them, you have nothing to do but to take the pommice from the press where verjuice has been made, or to gather up the crabs themselves when they have dropped from the tree, mash them to pieces by some means or other, and sow them, pommice and all, in just the same manner as directed for the sowing of the Ash. This work may be done in November, or at any time between that or the end of March.

207. The management in the seed-beds, and all the subsequent operations, including that of planting out, are just the same as those pointed out for the Ash. The plants ought to be cut down the year after planting; and if you want them to go up with a single stem, they ought to be pruned in the manner directed in paragraph 149.

208. There is an American Crab, the fruit of which would pass for a winter-apple in England; the leaf of

which is of a very ornamental shape, and that leaf dies in the autumn of a bright scarlet colour, and in that colour hangs upon the tree until nearly Christmas, as I have had it hang in my garden in Kensington.

THE CYPRESS.

In Latin, *Cupressus Disticha;* in French, *Cypre.*

209. The botanical characters are:—It has male and female flowers, at distances, on the same plant; the male flowers are formed into oval katkins, in which the flowers are placed thinly, among several roundish scales, each having a single flower. These have no petals nor stamina, but have four summits, which adhere to the bottom of the scales. The female flowers are formed in a roundish cone, each containing eight or ten flowers; the scales of the cones are opposite, each having a single flower, these have no petals: the germen is scarcely visible, but under each scale there are many punctures or spots, and a concave truncated apex, instead of a style; this afterwards becomes a globular cone, opening in an angular target-shaped scale, under which are situated angular seeds.

210. This is one of the largest trees in the world. MICHAUX says that it frequently attains the height of one hundred and twenty feet, and as frequently forty feet in circumference, at a considerable distance from the ground. He says that HUMBOLDT found several of these trees in the ancient garden of the Emperor of Mexico, which were planted there before the first arrival of the Spaniards in that country. This tree delights, not in a swamp, but in wet land on the borders of rivers, marshes, or swamps. Its timber is better than that of the Pine, more close, finer grained; after being some time exposed to the air, it is of a reddish colour, and it is of great strength and elasticity. The tree, as an object of beauty, surpasses almost every other. It drops its leaves in the fall, or, rather, in the win-

ter; but they come out again early in the spring, and hang on till nearly Christmas, being of a reddish colour for six weeks before they come off. The branches come out from the sides of the tree like those of the Larch, but they are more pendulous; the leaf is finer and brighter; it is much thicker on the branch; and the tree, taken altogether, is certainly one of the very finest of vegetable productions. In the time of Miller, there were but three or four of this sort of tree in England. I myself never saw but one here; and that is now standing in the ornamental part of the estate, at the farm-house of which I am now writing, and which was an object of great beauty even so late as Christmas day.

211. The SEED of this tree does not ripen in England; but it is easily enough imported, and I have sold some thousands of the trees this year. The cones came to me packed up in barrels, mixed up with dry sand. We easily squeezed them to pieces, and then sowed them, shells and all together. They come up the first year, and attain the height of about a foot before the month of October.

212. The SOWING is in beds, and the manner of doing it the same that has been pointed out in the case of the Ash, only that the covering ought not to be of greater thickness than an inch and a half. Great care ought to be taken to keep the plants perfectly clear of weeds; for they suffer exceedingly if annoyed by them. About the middle of summer the ground should be broken a little between the plants, to favour the operation of the dews; for it is desirable that they grow as much as possible the first year.

213. The plants ought to be removed in the same manner, but with very great care, as directed for the Ash; if put

into plantations, the distances might be from five to six feet apart; keeping on cutting out or thinning, as the trees approach too near to the branches of each other; but I do not know that any *pruning* would be necessary or proper in this case. The young trees, when cut out, would serve for poles or some other uses.

214. As to *cutting down*, the year after planting, though this is really a deciduous tree, that perhaps would not be proper, and indeed I think it would not, though I have no experience to guide me. This tree appears to be something between a Fir and a deciduous tree. It is resinous, and I do not know whether, if cut down, it would throw out any shoots at all. Great care must therefore be taken, that the young plants do not lose their leading shoots, or, if they do, to see that they have another leader as quickly as possible. They are very apt to be nipped by the frosts in the seed-bed, which is of not much consequence if you cut off the dead part with a sharp knife, and make your cut sloping opposite a bud, so that a new leader may come the second year.

215. This tree, as well as the Cedars and all *evergreens*, ought to be moved either early in the fall or late in the spring, and with great care, kept out of the ground as short a time as possible, and the roots not exposed to the sun or to the wind. In the case of deciduous trees in general, it does not signify much, if the tops of them be insufficiently supplied with sap the first year; because the next year they are to be cut down to the ground, and the root will have got strength sufficient to send up new shoots and put every thing to rights. This is not the case with Evergreens: if they be cut down, the *root instantly dies*. For this reason, also, there must be *very little pruning of the roots* in these

cases. The long and straggling roots may be taken off, but the fibres must not; and the whole must go into the ground again as entire as possible. This is a matter of very great importance, and ought to be most strictly attended to.

THE DOGWOOD.

In Latin, *Cornus;* in French, *Cornuiller.*

216. The botanical characters are:—It has many flowers included in one common four-leaved involucrum, which is coloured. The flowers have each a small empalement, sitting on the germen, which is indented in four parts. They have four plain petals, which are smaller than the leaves of the involucrum, and four erect stamina, which are longer than the petals, terminated by roundish summits. The round germen, situated below the empalement, supports a slender style, crowned by an obtuse stigma. The germen afterwards becomes an oval or roundish berry, inclosing a nut, with two cells having an oblong kernel.

217. There are several varieties of the Dogwood, two or three of which are natives of America; but these are merely flowering shrubs, and are used for ornamental purposes. The Dogwood that I have to speak of is the underwood which, in our own coppices, goes by that name. Till very lately, I always looked upon this as a perfectly insignificant, or, rather, mischievous plant. It will grow in very poor ground, to be sure; but I never saw it used for any other purpose than that of fuel, and never saw it grow to any considerable size. I never saw it formed into a hoop, a hurdle, a rod, or a stake. But of late years it has been discovered that it makes the very best of charcoal for using in the manufacturing of *gunpowder;* and, therefore, considering that we have such a thundering

standing army, which we cherish with so much assiduity, and of which we have become so very proud, in this age of the wonderful "march of intellect," this once despicable plant now becomes of importance, and merits at least some degree of our attention. That the wood is used for the purpose just mentioned, I am certain; for I have seen great quantities of it in Sussex, stripped of its bark even up to the ends of the small shoots, and tied up in bundles to be sent to the powder-mills.

218. The tree, or, rather, the plant, is a very despicable-looking thing, slender in stem, not quick of growth, naked of foliage, and ugly as anything of the tree kind can possibly be. It bears an insignificant flower, after which comes a little oblong berry, the pulp of which covers a hard furrowed stone of the same shape.

219. The SEED, if any one should be disposed to cultivate the plant, must be gathered in October or November, which it may be in great abundance, and preserved in just the same manner as directed for the cherry-stones. I do not know whether the seed of our Dogwood comes up the first year; but I know that that of the American Dogwood does not. The best way is to sow the seed early in the year, to keep the beds very clear from weeds, and to wait the result. When the plants are up, they are, whether as to removal into the nursery, putting into plantations, after culture, cutting down the second year, to be treated in the same manner as the Ash, and the seed is to be sowed in the same manner as the Ash seeds.

220. But, as to the season of cutting a coppice of this kind, if the *bark be to be taken off*, as it must be for the making of powder charcoal, the felling of the coppice ought not to

take place until the spring, when the *sap is in full motion;* because it is only then that the bark will come off. As in the case of the Oak, you must cut before the leaf comes out; that is to say, before any part of the sap is gone out of the tree; and yet you must not cut before the sap be in full motion: you must cut before the buds have bursted out into leaf, and yet not before they be nearly ready to burst. This, therefore, is a nice point; and as we live in a day when gunpowder is considered as of such primary importance, this point ought to be attended to. Whether the great Creator of trees destined the Dogwood to make such a respectable figure at last, is more than I can say; but, according to present appearances, this once despised and abominated plant, which was a by-word amongst country people, from whose contempt of it, doubtless, its name arose, is in a fair way of becoming the *premier* amongst the inhabitants of the woods.

THE ELDER.

In Latin, *Sambucus;* in French, *Sureau.*

221. The botanical characters are:—The flower has a small empalement of one leaf, cut into five parts; it has one concave wheel-shaped petal, cut into five obtuse segments at the brim, which are reflexed, and five awl-shaped stamina the length of the petal, terminated by roundish summits, with an oval germen, situated under the flowers, having no style, in room of which is a swelling gland crowned by three obtuse stigmas. The germen afterwards becomes a roundish berry with one cell, including three angular seeds.

222. The Elder tree is known, as to its form and appearance; as to its flowers and fruit; as to the uses of that fruit, and the various uses of the leaves, the flowers, and the bark, in medicine: thus far this tree is known to every body, but

it may not be so well known to every body that it may be raised from seed, as well as from cuttings; and that its wood yields to that of very few trees, in point of compactness, hardness, and durability. Elder-wood, when it attains any size, is frequently made use of for inlaying, for the making of rules, and for many of those purposes to which the wood of the box is applied; and it is not much inferior to the box in point of fineness of grain, though it is not so clear, and not quite so yellow, as the wood of the box. There is scarcely any tree which shoots so far in a year, as the Elder; yet, even in its young state, it is a very hard and durable wood. For the first year, the shoot is absolutely hollow: it is a piece of pith surrounded by a crust of wood; and every man knows that, when a boy, he has made pop-guns of it; and most of the men now alive, who look well at the consequences of other guns, that have brought so much dignity to the Dogwood, must heartily wish that the whole nation could return to the exclusive use of the Elder. In the third year of its growth, however, the wood gets rid of this pith; and by the end of the fourth or fifth year, the shoot will make a *stake*, the durability of which has long been so proverbial, as to give rise to the following couplet:—

> "An Elder stake and a Hazel heather
> Will make a hedge to last for ever."

The reader must know, that the stakes are the upright supporters of the hedge; but he may not so well know, that the *heather*, which ought, perhaps, to be *header*, are the rods which are put along on the top or head of the hedge, to fasten the bushes, or other stuff, down.

223. The propagation of the Elder is generally, if not always, by *cuttings* (cut off any time between September

and March), little or big, stuck into the ground, in which ground, whether dry or wet (if not absolutely in water), the cutting is sure to become a tree, and that too in a very little time. The Elder likes moist ground best; and, like other trees, it likes good ground better than bad, but it will grow in any ground.

224. The SEED of the Elder is the little berry that it is well known to bear in such great abundance. This seed, if you mean to sow it, should be gathered when dead ripe; should be put into sand, in the manner directed in the case of the Cherry; should be kept in that state until March, and then sowed on beds, in the manner directed for the Ash, only that the seed should not be covered with earth more than an inch deep. The plants will come up in the latter end of May, and will be a foot high in the fall of the year. The after-treatment is to be just the same as that directed for the Ash, until the plants be finally put out; and as it is not here a question of plantations, there is no occasion for speaking of distances. If you wish to have them to grow tall and to have a clear stem, you must cut them down and prune them, as directed in paragraphs 127 and 149.

225. I cannot conclude this article without expressing my surprise, that no one appears ever to have cultivated the Elder from seed. The reason why we always see them squat, bushy-headed things, is, that they are always raised from cuttings, that being the easiest way; but we should always remember, that a cutting is a *branch of a tree;* and that a branch it must always continue, and never can become a tree, with a regular butt and trunk. The reason why Apple trees are invariably bushy-headed, is, that they are branches of trees. The stem, indeed, may have come from

a seed, but the graff is a branch, and from the graff comes the head of the tree. If the Elder were raised from the seed, I have no doubt of its attaining a height equal to that of the Horse Chesnut. At that height, its flowers would make a grand show; and as to the timber, it would, I verily believe, be the rival of the Locust. Its hardness fits it for many purposes, and great durability accompanies this hardness.

226. There are several American Elders, varying from each other in the size and shape of the leaf, and all varying from ours. Michaux makes no mention of these Elders; but I have some plants of the American Red Elder now growing in my garden.

THE ELM.

In Latin, *Ulmus;* in French, *Orme.*

227. The botanical characters are:—The flower has a rough permanent empalement of one leaf, cut at the rim into five points, and coloured within; it has no petals, but has five awl-shaped stamina twice the length of the empalement, terminated by short erect summits, having four furrows and an orbicular erect germen supporting two styles which are reflexed, and crowned by hairy stigmas. The germen afterwards turns to a roundish compressed, bordered capsule, including one roundish compressed seed.

228. Miller reckons six sorts of Elms known in England; but I shall speak of the mode of cultivating this tree, having in my eye the common English Elm, with small leaves, oval, acute-pointed, doubly sawed, and unequal at their base, which Miller calls the *Ulmus Stativus.*

229. It is very curious that Miller, after having very

accurately described the flower and the *seed* of the Elm, should, when he comes to talk of the propagation of the plant, not say one single word about propagation by seed; but falls to work to tell us, that the tree is propagated from *suckers*, or from *layers*, and that *layers* are better than *suckers*, because, in taking up the young plants, there is not so much danger of tearing the roots to pieces. This is a very curious way of plastering over a want of knowledge of his subject. Why did he not get some of the seeds, as they were to be got in such abundance, and try them in his garden; surely the seeds were not made for nothing. There never was a seed yet, which, if perfect, would not produce the like of the plant it came from. The Scripture tells us, that every tree bears its seed in itself; and certainly it does, though laziness and inattention resort to cuttings and layers, and thus produce a degenerate race of many sorts of trees. Almost all the Elms are propagated from *suckers:* suckers produce suckers; and every farmer knows what a curse an Elm tree is, standing on the side of a meadow or a field. As to *layers*, they are like cuttings or branches of trees, and he must be a fool, indeed, that expects a long and clear trunk to come out of a branch.

230. We all know the various uses of the Elm; it is used by wheelwrights for various purposes: its boards, though not good, come quickly; the tree grows fast, and to a great size; it has an ample foliage, and though by no means beautiful, it soon makes a bare spot look green: the tree will grow in almost any soil; though it likes good ground better than bad. It is one of the great trees of the country; the fuel it gives is good; and certainly some pains ought to be taken to have the tree straight and clear, free from suckers coming out from the roots, and free from those everlasting knots and knobs which suckers invariably have

upon their trunk. Besides this, there is the great *expense* of suckers and layers. Miller may say what he pleases about stools in a nursery, to get layers from; but recollect the vast difference between the trouble of layers and that of raising the plants from the seed.

231. Now I know that the Elm is easily raised from the seed. Miller tells us, that there are "*some* who raise Witch Elms from seed"; and why not raise all Elms from seeds? I have made no actual experiment with the English Elm; but I see the seeds in great abundance, and I can see no reason why one should not come from the seed as well as the other. I have experience with regard to the American Elms, for I have *sown the seeds, and have the plants;* and now I shall proceed to give my directions for propagating the Elm from seed.

232. The SEED, which the trees generally bear in great abundance, bears a strong resemblance in point of shape to a fried egg, the white of which spreads itself out in the pan, while the yolk lies in a little raised lump in the middle. That little lump of oblong shape, but wider at one end than the other, is the seed; that which surrounds it is a sort of wing, very thin, which is doubtless intended to convey the seed a distance from the tree. These seeds, which at first are green, become of a pale brownish colour in May, and then they are ripe.

233. In speaking of the sowing of the seed, the best way will be for me to give an account of what I myself did. The seeds ripen in the month of May, in America, and I had some seed sent thence to me, in that month. Anxious to know whether the seeds would grow, I sowed a part of them in July; and, in the month of September, in spite of

Chaffinches and Greenfinches, the plants came up and got into rough leaf before November; when, being so very young, the severe frosts which we had in that month, did, I am afraid, totally destroy them. I shall not be sure of this for a month or two hence (it is now February); but I ascertained the fact that Elm seeds will grow as easily as Onion seeds, and that they will come up much more quickly. Mine came up before I expected that they would; they had been poking their heads out of the ground two days before I perceived it; and, when I did perceive it, I perceived the ground covered over with the roots, with which the Finches, from their closely neighbouring abode in a warm and lofty shrubbery, had strewed it, by stripping off the heads of the seed, the moment they made their appearance above ground.

234. Let me stop here to beseech, with the greatest earnestness, all those who sow Elm seeds, to guard the beds effectually against these unreasonable, persevering, and ever-active foes. They set at defiance all your boys and girls and shoy-hoys; they have done their work for the day long before any boy or girl or man can be got out of bed. These gentry go to *their* beds at sun-set, a very good hint for us; and they have their meal for the day many minutes before the sun rises. At the first glimpse of the Aurora they are on your beds; nothing escapes their eye, and the beak follows the eye instantaneously. I knew that these provoking creatures never gave rest to radish, turnip, and other peppery seeds; I knew that they harassed the beds of firs and spruces; but how should I think of their being so fond of a rough and husky seed like that of the Elm, and especially when I knew that neither they nor their progenitors had ever seen a bed of Elm seeds before. Such,

however, was the fact; and, instead of twenty thousand plants, I got perhaps three.

235. I sowed my seeds with the following preparation, and in the following manner:—First, owing to my impatience to ascertain their soundness, I soaked them and mixed them with earth, in the manner that I have described with regard to the Birch seeds, in paragraph 158. When I saw that the seeds were grown very plump, I sowed them on beds, on which I first sifted some earth, and, when the seeds were sown, I covered them with finely-sifted earth, about an inch deep. If they had been sown in the spring, they would have attained the height of twelve or fifteen inches by the month of October; and, as it was, they generally attained the height of two or three inches, and had long and beautiful rough leaves upon them when the frost overtook them in November. This, therefore, is the way in which I recommend the seeds of the Elm to be sown.

236. As to the manner of preserving the seeds; when gathered, which, as we have seen, is in the month of May, they should be made as dry as paper, by being placed for several successive days in the sun. When they are perfectly dry, put them into bags, not more than two or three gallons in each, and hang them up in a perfectly dry place. There they will safely hang till the next month of April, and then they ought to be sown in the manner I sowed mine. If you soak the seed, you ought to water the beds, gently, the next day, and, whether you soak them or not, you ought to shade the beds with mats laid on them until the seeds begin to come up; that is to say, if the weather be very dry. A gentle watering in the evening, and shading in the heat of the day, will soon bring them up, whether soaked or not.

237. The beds being kept carefully weeded, and most effectually guarded against birds, which I defy you to do unless you cover with glass, which is bad for such things, or with a net that is so fine that a Finch cannot by possibility get its head through, it being impossible to guard against the birds by coarse nets, which, though you double, or treble, or quadruple them, will shade the ground, and will yet leave some hole for the birds to get through: these precautions being taken, your plants, which are very slender, and which may stand very thick in the seed-bed, will be fit to go into the nursery in the month of October, or early in November, after which their treatment is to be precisely that of the Ash, even to cutting down the second year, and pruning as directed in paragraphs 127 and 149.

238. With regard to *distances*, it is hardly necessary to speak of them, as Elms are generally destined for avenues, hedge-rows, or independent situations; they may, however, form a clump, or even a plantation; and in that case you must prune and thin out, as the plantation grows, in the same manner as directed for the Beech in paragraph 149.

239. Elms, like all other deciduous trees the bark of which is of no use, are cut when the leaf is off, and the sap is down. Young ones will come up in prodigious numbers from the roots after the tree is cut; and therefore the best way is to *grub* the tree, and to rely upon the seeds for young ones. A quart of Elm seeds consists, I should think, of about *two thousand* in number. These will stand very conveniently upon *one rod* of ground, as a seed-bed. Here are two thousand plants obtained at the expense (if of English seed) of less than *half-a-crown*, weeding and every thing included. A man will dig the rod of ground in an hour, and sow it in another; and it would be hard to find

a person so lazy as not to perform three weedings in the space of half a day. Elm trees, from the *nurseries*, must be dear. The work of raising layers is tedious; a monstrous space is required to raise many thousands. It is impossible for a nursery-man to raise them in this way, and to produce good plants, under four or five pounds a thousand. *Suckers*, he may, indeed, find enough; but they must be dug up; they must be brought from some distance; they must be trimmed, head and root, before he can put them into the nursery: after that they must be cut down, and have a year's growth after that, even in the nursery, before they can be put out into plantations; and after all they are poor scrubby things, with an imperfect and half-rotten root; and though they generally will grow, it is next to impossible that they should ever make a fine tree. As to the *layers*, they are produced by fixing down a large branch upon the ground, and laying earth upon the stems of the smaller branches. It is two years before they get roots sufficient to suffer them to be removed; they are then put into a nursery in rows: there they are cut down, and must have the growth of a year or two before they can be finally planted out.

240. THE WITCH ELM.—This is the only other Elm that we have which is of any importance; Miller calls it the *Ulmus Campestris*, or common ruff or broad-leaved Witch Elm. The propagation of this is in all respects like the former. In some parts of the kingdom it is preferred to the first, for its timber; and as Miller himself confesses that some people raise this Elm from seeds, it is impossible, one would think, to find an apology for the bungling, the tardy, the expensive practice, of raising the plants from *suckers* or *layers*.

241. AMERICAN ELMS.—There are, according to Michaux, the White Elm and the Red Elm, the former being the largest and finest tree, and also producing the best timber. These Elms are greatly superior to ours: the tree is much loftier; the foliage, beyond all comparison more beautiful, and the wood finer grained; and, in every respect, far preferable to ours. The seed sent to me the year before last, which came from the borders of Lake Ontario, were gathered from a tree which had *a clear straight stem seventy feet high before it began to ramify.* The leaves of these Elms are between three and four inches long, rather narrow in proportion to their length, very pointed, very much sawed, and of a lively beautiful green, which they retain throughout the whole of the hottest summer.

242. Now if it were to be believed that the seeds of the English Elm cannot be made to grow; if it were possible to make any rational being believe this, why not import the seeds from America? Nothing can be easier; and I do not say this without having given proof of the fact. I have done the thing myself; and therefore I have a right to say, that any planter may do it if he will. But, and with this remark I shall close what I have to say upon the subject of the Elm, great care must be taken that the seeds be not put together in such a state as to expose them to fermentation. All vegetables are prone to ferment, if put together in considerable quantities. Not one thousandth part, perhaps, of the grass-seeds grow, that have once been in a hay-rick. The sweepings of a hay-loft will produce a prodigious number of plants; but I am convinced, that, if the rick have heated, no growing seeds will come out of any part of the hay, except that part that has lain near the outside of the rick. In the case of seeds like those of the Elm, you do not

perceive, when you open the package, that they have fermented. They even appear to be sound and solid; but if there have been fermentation the seeds will not grow; the germ is the thing of importance; it is very tender, and is destroyed by the least degree of fermentation. I expected at least two hundred thousand plants from the Elm seeds which I imported the summer before last. Nothing could appear to be in better condition. I sowed them with as much confidence as I should have sowed radish seed that I had raised myself, and not one single seed ever came up.

FIR.

In Latin, *Abies;* in French, *Epicie.*

243. The botanical characters are:—The male flowers are disposed in a loose bunch, having no carolla, but many stamina, joined in form of a column at their base, but separated above, having erect summits. The females are collected in an oblong cone, each scale inclosing two, which have no carolla, a small germen with a single stigma. These are succeeded by membranaceous winged seeds.

244. We call every thing *Fir,* whether it be of the *Pine* sort or of the *Spruce;* but, as the manner of propagating and planting of both descriptions are the same, I shall not encumber my work by an useless division in this respect. I shall treat of Pines and Spruce all under one and the same head. I will give here, however, from Miller, the botanical characters of the Pine species.

PINE.

In Latin, *Pinus*; in French, *Pin*.

245. The botanical characters are:—The male flowers are collected in a scaly conical bunch; they have no petals, but many stamina, which are connected at their base, but divided at the top, terminated by erect summits; these are included in the scales, which supply the want of petals and empalements. The female flowers are collected in a common oval cone, and stand at a distance from the male on the same tree. Under each scale of the cone are produced two flowers, which have no petals, but a small germen supporting an awl-shaped style, crowned by a single stigma. The germen becomes afterwards an oblong oval nut, crowned with a wing included in the rigid scale of the cone.

246. All Firs, both descriptions, bear their seed in cones, which, like most other things, ripen in the autumn. If they be suffered to hang on the tree, and do not fall down before the next summer, the warmth of the sun opens them; and the seeds, which are furnished with a little wing, fall out, and are borne away by the wind; and they will sometimes come up, and grow into trees, if they be shaded a little from the sun, and sheltered from the drying winds. You, therefore, gather or pick up the cones in November, or sometime before the spring; dry them well, and put them by till about March. Being then exposed to the sun, or laid near to a warm fire, the scales of the cones burst open, and the seeds come out. If suffered to remain in the cone, by not being exposed to heat, the seeds will remain good for a dozen, or, perhaps, for twenty years; but, if taken out of the cones, they will not keep good for more than a year or two; or, at least, this is generally the case.

247. As to the manner of sowing these seeds, which work is to be done as early in the spring as the ground will work

well (which generally is about the middle of March), you prepare the ground in the manner directed for receiving the seeds of the Ash, for which see paragraphs 109 and the following; with this material difference, however: that, in case of fir-beds, the alleys, for a reason by and by to be mentioned, ought to be two feet wide at the least. The ground, when the beds are formed, ought to be made very fine; and if the earth were sifted on, it would be the better, because these seeds are very tender, and do not come up well in rough ground. When the beds are prepared, you sow the seeds on them pretty thickly. If the weather be very windy, it is convenient to mix the seeds with sand that is rather damp; and, indeed, it were not amiss if this were done in all sorts of weather, especially in the case of the smaller seeds, which are very apt to fall out of the hand in great quantities in particular places.

248. The seed being sowed, pat it gently down with the back of the spade, and then cover it with sifted mould taken out of the alleys. This mould should not be more than an inch in depth, and should be put on with great evenness.

249. If the weather be dry, water the beds with a fine rosed watering-pot, but by no means do this until the ground be *perfectly dry;* for, if you water while the earth is *fresh* from its recent removal, it runs together and becomes baked by the sun, which is very injurious to the coming up of the plants, which would begin to appear in about six weeks; and then all your pains are thrown away, unless you keep off the *birds*, which are mortal enemies of everything bearing the name of Fir-seeds. Your precautions on this score must not wait till you can see the seeds breaking the ground. The finches will make the discovery long before you will. They smell the seeds under the ground,

and they watch their appearance with an assiduity beyond belief. No eye is like that of a bird; otherwise, how does a pigeon, that is actually up in the clouds, discover grain scattered upon the earth? The finches from the neighbouring trees, or, if there be no trees, by flying over the garden, ascertain all that is going forward. You cannot protect yourself by *mats;* because the seeds, if they came up under the mats, would be so weak as to perish. If you put the mats on by day, and take them off by night, the birds will be on the beds and have finished their work in the morning before you can get a human being to the spot. Glass is out of the question in such a case; and therefore you must have *nets,* the meshes of which are too small for a finch to get its head through. These nets must be put over rods bent in a semicircular form across the beds, with other rods tied upon them long-ways, so that the bed will have a covering resembling the tilt of a waggon. Then you must take care that the lower edges of the net be pinned down closely to the ground, all the way along on both sides; so that there be not a single hole left, at which a bird can creep in. Besides the birds, there are the mice, equally fond of these seeds. They get at them even before they break the ground. They set nets at defiance; and whereas the others work by day, these gentry work by night. Traps, poison, all sorts of means, but live-traps baited with cheese, particularly, you must resort to, especially if you be near a shrubbery, or a grass-ground, or any place that harbours the mice. Without these precautions, it is perfectly useless to sow the seed. I had some beds last summer, of both Pine and Spruce. I have probably fifty thousand plants; and I am perfectly convinced that if I had left the beds wholly uncovered, and had made use of no mean to destroy the mice, I *should not have had one single plant.* As it was, I lost much more

than half, and thought myself lucky to preserve what remained.

250. The plants should be kept perfectly clear from weeds, watered gently in dry weather during the summer, and the ground between the plants should be moved a little gently now and then, so as to give the plants the benefit of the dews. The wide alley will give scope for all this work, and for the netting and mouse-catching. If you take a narrower space than two feet, you will sometimes trample the edges of the beds, and will be apt to disturb the edges by fixing in the ends of the hooped rods.

251. If the plants be taken proper care of, and if the ground be suitable to them, they will in general be two or three inches high by the month of October. They ought to stand in the beds another year; for they are so very small, as to make it extremely difficult to transplant them, in a proper manner, the first year.

252. Having now brought the plants to the age at which they are to be removed from the seed-bed, I proceed to give directions for the removal. The *preparation of the ground* in the nursery is precisely the same as for the *Ash;* but the plants must be taken up with the greatest care, and there must be *no pruning of roots*, except just at the point of the long middle root. The work should be done in October or in March, and not in winter. The plants ought to be removed in such a way as to shake but little of the earth from the fibres; and, above all things, the roots must be close kept from sun and wind.

253. The plants ought to stand in the nursery but *one* year, or two at most, before they go into plantations, where

the work of planting ought to be done in the manner directed for the Ash. If amongst *heath* or *furze* or *rocks*, there must, of course, be mere *holes*, instead of *trenching*. But the work of planting is still to be done in the same manner, only extraordinary care taken to keep the roots, while out of ground, from the sun and wind.

254. But, in the case of *Firs*, of any description (and the same may be said of the *Cedar* and the *Cypress*), there is no need of any *nursery* at all; and the best way is, to let them stand, not too thickly, *two years in the seed-bed*, and then put them, at once, into plantations. They will not be above seven or eight inches high; but they will be ten feet high before plants, put out at four feet high, will have attained the height of seven or eight feet. This Miller saw proved in numerous instances, and I am sure of the fact from repeated experience, and from the observation of my whole life.

255. With regard to the *distances* in the plantation, something must depend upon the sort of Fir, and upon the *uses* to which the plantation is destined; and the *Spruces* spread, in their early stages, wider than the *Pines*, and, therefore, might reasonably have more room. Four feet for the latter and five for the former may, generally speaking, be a good distance; for, though they never can become large trees at these degrees of closeness, they draw each other up, shelter each other from cutting winds, and rise faster than if at wide distances. They should, however, be *thinned out* before their boughs interfere with each other; first taking out *every second tree* throughout the plantation, and, next, *all that remain in every other row*. Even at this distance, they will not attain a *very* great height; but, at every thinning, they will get more and more room, while those

that are cut out will yield a profit, and, generally, a great profit. The first thinnings will yield *poles;* the second, rafters for out or temporary buildings; and the subsequent cuttings will, if the *sort* be pretty good, make narrow boards, and stuff for various useful purposes.

256. Firs will *grow* on the *poorest* of land, though not so well as on good land. The *Spruces* come chiefly from the barren rocky lands of North America; and the lands, where the *Pines* of America abound, are actually called *Pine-barrens.* The Firs do not much like clay-land; but they will grow on it very well, and especially the Spruce-Firs. Certainly, as articles of *profit,* they ought to be allowed none but the worst lands; for they yield in value of produce to almost every other sort of tree, if both be planted upon tolerably good ground.

257. Firs, if in a close plantation, ought to be kept *pruned,* and according to the rule in paragraphs 127 and 149. The prunings, tied up in fagots, pay well for the labour, and they are by no means bad fuel for lime-kilns and brick-kilns, and will burn better green than dry, which is a great advantage. But, in this work of pruning, care ought to be taken to cut close to the trunk, and with a sharp knife.

258. When Firs are felled, their stems and roots ought to be grubbed up; for, like the Cedars and the Cypress, the stems never throw out shoots; and these stems encumber the ground, and do a great deal of mischief. It is the same with the stems (or *moors* as they are sometimes called) of all trees; but the stems of deciduous trees will generally throw out new shoots, some of which, as in the case of the Oak, will become trees; but Firs never throw out any shoots at all: when once cut down, they are gone for ever. When

Firs lose, from any cause, their *leading* shoot, the remaining part of that shoot ought to be cut clean out with a sharp knife; and they will presently, in one of the side-branches, find a new leader, without giving you any trouble.

259. There remains now, under this head, little more to do than to give a list of the several sorts of Firs that I think worth planting in England; just observing here, that the *Larch* is to be spoken of in its proper place, and that the *Cedar of Lebanon*, which is certainly *a Fir*, is, in all respects, propagated and cultivated like the Fir, but that, though a most magnificent ornamental tree, never can, from the badness of its timber, be planted as an article of profit. I shall begin with the Spruce Firs, and then come to the Pines.

260. 1. The Norway Spruce Fir (*Abies Picea*), which has a large long cone, and is very common in England. 2. The Balm of Gilead Fir (*Abies Balsamica*), which has a shorter cone and thicker leaf. 3. The White Spruce of North America (*Abies Alba*), with a narrow cone about an inch and a half long. 4. The American Black or Double Spruce (*Abies Nigra*), with a cone about an inch and a quarter long, and bigger round than the last-mentioned. 5. The American Silver Fir (*Abies Balsamifera*). The cone of this Fir is about three inches long, and the tips of the scales are of a silver-like colour. The leaves are white on the under side, so that this is a very beautiful tree. 6. The Hemlock Spruce (*Abies Canadensis*). The leaves of this Spruce are shorter and smaller than those of the other sorts, and the cone is not much more than half an inch long, and proportionably small in circumference.

261. With regard to the first of these, namely, the Nor-

way Spruce, it produces the deals that come from that country, and it grows sometimes to the height of 150 feet. The second and fifth sorts, which differ but little from each other, do not appear to be of much use, except as ornamental trees. The first is of European origin, and it is said to grow very high; but that of America rarely exceeds forty feet in height, and the wood, according to Michaux, is inferior to that of the other Spruces. The third sort, namely, *Abies Alba*, is also called the Single Spruce: it rarely exceeds the height of fifty feet; its timber is inferior to that of the Black Spruce, and its boughs are not good for the making of spruce beer. The fourth sort, namely, the *American Black or Double Spruce*, is a very valuable tree: it attains the height of seventy or eighty feet, while the diameter of the bottom of the trunk does not exceed above twenty inches. It is used as masts for ships, and is exceedingly useful in this respect. The *knees* of vessels are, at Boston, sometimes made of the Black Spruce, formed by the base of the trunk and one of the principal roots. Michaux says that it is tougher than the White Pine, but more liable to crack. The tree will flourish in the coldest and poorest of land; and Michaux says that the wood has been proved to be, in Europe, superior to the Norway Pine. The twigs of this tree are boiled in water, with a certain quantity of treacle or sugar, and the mixture is left to ferment. When the fermentation is over, the beer is fit to drink. The essence of Spruce is obtained by boiling the ends of the young branches in water, and then evaporating the water by boiling, until you have an extract left; and this extract is the essence of Spruce, which is brought to England in great quantities, but which might be made here as well as in America. This being a matter of some little importance, I ought to mention that Michaux notices, that Sir A. B. Lambert asserts that it is the *White Spruce*

which is made use of for this purpose, but that he, Michaux, had seen the process of making the beer many times, and that it was always made of the *Black Spruce,* and not of the *White;* to which I can add my not very little experience, having had no other sort of drink, except by mere accident, for seven years of my life. The copper in which we used to boil our beer, was built at the foot of a high and steep rock, which was covered with these Black Spruces. We used first to cut down the trees, then chop off the branches, or rather the points of the branches, then tie these up into little fagots, and toss them from the top of the rock down into the copper, jocosely dignifying the article by the name of *malt;* when it had boiled sufficiently along with the treacle, we used to let it ferment, then take it out (each company having its allowance per day), carry it in open tubs (old pork barrels), to our quarters, and the plenty was such, that each man came when he liked with the bottom of an old canteen, or some other such article, and regaled himself, upon the proceeds of these boughs; so that few people understand more about this matter than I do; and I agree with Monsieur Michaux, that it is the Black and not the White Spruce, that is used for this purpose. This is also a singularly beautiful tree; its branches extend out in a horizontal direction. The summit is a regular pyramid, and, in all respects, this appears to me to be the best of the Spruces. The sixth sort, or *Hemlock Spruce,* is a native of the same country, attains about the same height (about 70 or 80 feet), is deemed a very beautiful tree, grows to a larger bulk in the trunk, is very much esteemed as an ornamental tree in the United States of America; it is in fact, in look, a spiral Yew tree, only, perhaps, ten times as high; and, though the properties of its wood are such as to make it the least valuable as *timber* of all the large resinous trees of North America, its *bark* is used for

tanning in the countries where it grows; and, though it is doubtless inferior to the bark of the Oak, it is used for the tanning of leather, and very good and substantial leather comes from the process. It is used for this purpose at Boston and New Providence, and even in the State of New York; and, Michaux says, sometimes so far south as Baltimore. It is brought from the North, that is to say, from the district of Maine, to the parts of the United States just mentioned. Its deep red colour is imparted to the leather; and, Michaux says, that he has been informed by tanners, that though of itself it is inferior to the Oak bark, the two species *united* are better than either of them alone.

262. As to the Pines, Miller counts *fourteen* sorts, and Michaux adds several that Miller knew nothing about. It would be useless to make particular mention of each of these. I shall therefore notice only, first, the Scotch Pine or *Fir*, (*Pinus Sylvestris.*) 2. The Norway Red Pine. (*Pinus Rubra.*) 3. The American White Pine, (*Pinus Strobus*); and, 4. The American Pitch Pine, (*Pinus Rigida*).

263. As to the first of these, the *Scotch Fir*, every body in England knows too much about it, seeing that it now covers hundreds of thousands of acres that might have been covered by some valuable Pine, or by some other tree; for I know of no ground where the Scotch Fir will grow, on which Birch or Locust would not grow. The second, namely, the Norway Red Pine, is that which produces the best timber; the same Pine is found in abundance in America, and is there also called the Red Pine. It attains the height of seventy or eighty feet, and two feet or more of diameter at its base. The cone is small, not being more

than one inch and a quarter long, and small in its girt in proportion. The timber makes good masts for ships: Michaux states, that the main-mast of the St. Lawrence, a ship of fifty guns, built by the French at Quebec, was of this Pine. While young, the Red Pine has a beautiful aspect, and its vegetation is always vigorous. Some have spoken disparagingly of its timber; but Michaux says, that it has a fine compact grain, and that in Canada and Nova Scotia it is highly esteemed for its strength and durability. The third, namely, the White Pine, is one of the largest and finest of trees. The cone is something of the shape of the long spruce cone, and is not at all compact, but loose and rough. Michaux says, that he measured two trunks that had been felled for canoes, one of which was 154 feet long, and fifty-four inches in diameter. He says, that he has found the largest trees of it in the best land, but that it will thrive in any land that he knows any thing of. He does not speak so highly of the wood. He has observed, that it is the foremost in taking possession of barren desert lands, and the most hardy in resisting the impetuous gales of the ocean. The wood is so clear from knots, that it is very much in use where great strength and hardness is not required. Immense quantities of this timber are sent, in one shape or other, to almost all parts of the world. The fourth, namely, the American Pitch Pine. The cone of this pine is about an inch and a quarter long. The tree attains the height of seventy or eighty feet, and a diameter of from twenty to thirty inches. Michaux does not speak highly of the wood, but says, that from this tree abundance of pitch is procured.

264. It would be useless to state particulars relative to any of the remainder of the long list of Pines; and, as I have before given directions for collecting the seed, and

for doing every thing else, until the trees be put out into plantations, I have only to add here, that if seed be procured either at home or abroad, care should be taken that the cones be *ripe* before they be gathered; for, if they be not ripe, they will not open when laid in the sun, and if they were to open the seed would not grow. When the seed is once got out, the sooner it is sowed the better; but, as was before observed, if you cannot sow the seed the spring after you have collected the cones, the best way is to keep the cones unopened until the next year.

THE GUM TREE.

In Latin, *Liquidamber Styraciflua;* in French, *Copalm.*

265. The Botanical characters are:—It has male and female flowers sometimes on the same plant, and at other times upon different plants; the male flowers are numerous, disposed in long loose conical katkins; these have four-leaved empalements, but no petals. They have a great number of short stamina joined in one body, which are convex on one side, but plain on the other, terminated by erect twin summits, with four furrows. The female flowers are often situated at the base of the male-spike, collected in a globe; these have a double empalement like that of the male, and each of them has a bell-shaped, angular, distinct empalement, with many protuberances. They have no petals, but an oblong germen fastened to the empalement, supporting two awl-shaped styles, to which is also fixed the recurved stigmas, which are hairy, and as long as the styles. The empalement afterwards turns to a roundish capsule of one cell, with two valves at the top, which are acute, and collected in a ligneous globe, containing oblong acute-pointed seeds.

266. The Gum-tree (sometimes called the Sweet Gum) I do not recommend to be planted in England as a forest tree, there are so many others which are, in all respects, preferable to it; but it is so very beautiful a tree; the colour of the leaf, both when green and when it dies; the shape of the leaf, the form of the tree, are all so beautiful, and the

tree is so harmless as to the herbage beneath it; it would be so ornamental to parks, and near to houses, that I think it right to speak of the manner of raising it.

267. The SEED is contained in a round cone or ball, about the size of a small walnut, but perfectly round, and having prickles on the outside of it. When this ball is laid in the sun, or near a fire, these prickles, which close up apertures in the ball, yield away from each other, and leave the apertures open for the seed to come out. If you do not receive the balls soon enough in the spring to sow the seed the same year, do not endeavour to get out the seed until next year, for the seed, like that of the Firs, will not keep well out of the cone.

268. As to sowing, turn back to the directions given for sowing the seed of the Fir, and sow the seed of the Gum Tree in precisely the same manner, but not nearly so thick; cover the beds with nets also; for I have perceived that both mice and birds are very active enemies of this seed. The seed should be covered no deeper than has been directed in the case of the Fir, and the earth ought to be equally fine; for it is a very tender seed, and does not easily come through ground that is stiff or rough. When the young plants come up, great care must be taken not to loosen the earth too much about them when you pull up the weeds; and, after a weeding, there should always be a gentle watering, if the weather be dry. The season for sowing is that of the Fir.

269. In October, the plants will be about six inches high. Their removal into the nursery, and their management there, are precisely the same as directed in the case of the Ash. The Gum has a very bushy root; and there-

fore it is removed with great ease and safety. As it will generally be wanted as single trees, or as clumps in parks, it may, if required, stand in the nursery till it be four or five feet high, and it will, even then, remove very well. This tree would be beautiful in clumps, where it might be planted at four feet distances, and thinned out in the manner before several times directed for other deciduous trees.

270. Of the WOOD of this tree, Michaux does not speak highly, but the contrary. He says, it yields in point of quality (though in making articles of household furniture it is frequently used), to the Black Walnut and Wild Cherry; but that still it is frequently used for such articles, but particularly in the making of bedsteads. Michaux adds, that this tree has grown for some time in France; but that it never has been known to ripen its seed in Europe.

THE HAWTHORN.

In Latin, *Mespilus;* in French, *Aubépine.*

271. The Botanical characters are:—This tree is a species of the Medlar. The empalement of the flower is permanent, of one leaf cut into five spreading concave segments. The flower is composed of five roundish concave petals, which are inserted in the empalement. The number of stamina are different in the several species; from ten to twenty or more; these are also inserted in the empalement, and are terminated by single summits. The germen is situated under the flower, and supports an uncertain number of styles, from three to five, which are crowned by headed stigmas. The germen afterwards becomes a roundish berry, carrying the empalement on its top, and enclosing four or five hard seeds.

272. If we all knew how to propagate and cultivate this tree as well as we know the height and the size of the tree, and the leaf the flower and the thorns that it bears, I might leave this name without any remarks appended to it; but it

is in fact a tree or shrub of very great importance in this country, and the propagation and cultivation of it deserve particular attention, which attention, therefore, they shall receive at my hands.

273. The SEED is, in the first place, a little red thing in the shape of a Medlar, which becomes ripe in the month of October. The seeds should be gathered then, or beaten off the bushes, or the birds soon take them all away. When the seeds are collected, they should be put directly into some safe place, mixed with sand rather wet, three bushels of sand to one bushel of berries, and should be kept and treated in exactly the same way as directed for the treating and the keeping of the seed of the Ash, for which see paragraph 107.

274. When the time arrives for sowing, which will be the second month of March after it has been gathered, the seed ought to be sown in precisely the same manner as directed for the Ash, in paragraphs 111, 112, and 113. When the seeds come up, and even before they come up, take particular pains to keep them clear of weeds; and, as has just been mentioned for the Gum tree, if you weed in dry weather, give a gentle watering on the beds after the weeding has been done, to settle the ground again which has been moved near the roots of the young plants. If the ground be good, and proper care has been taken during the summer, the plant will be six inches high before the month of October; but you must treat the plants well, or else they will not.

275. In removing the plants into the nursery there will be no great difficulty; for they have good roots, and they remove very well; but, in this case, very great care must

be taken to assort the plants well; to class them into strong ones and weak ones; and, perhaps, three classes would be better than two. It is of the greatest consequence in the putting these plants finally out, that there be no mixture of weak plants and strong plants; because when the plants come to go into hedges, the strong plants will overtop the weak ones, and leave gaps, which can never be very easily closed up again; the weaker plants may stand a year or two longer in the nursery than the strong ones according to the purposes for which they are wanted.

276. No one makes a *plantation* of HAWTHORNS. The great use of the tree is to make *hedges*, commonly called Quickset Hedges. The age of the plants for this work, and the manner of doing the work, are detailed at full length in paragraphs 34 to 37 inclusive, to which the reader will be pleased here to refer; but, in that part of the work, having spoken of a *high bank* whereon to plant the hedge, I ought to mention here, that precisely the same instructions are to be followed if the hedges are to be planted on the level ground.

277. If plants are wanted to make part of a shrubbery, or to become standard trees in a park or a lawn, they should be pruned up the sides as they proceed, in the nursery, where they should not stand above four or five years, and they should have one removal in the nursery, and one summer's growth there, the year before they be finally removed. This will give them a bush root; there will be little of the root to amputate at the final removal; and they will strike off in the new ground, if they be carefully planted there; that is to say, if the work of planting be performed in the manner directed in the case of the ASH. If thus planted, they will start afresh with very little check.

278. When Hawthorns are planted out singly, or in clumps of three or four, it is very desirable that, to their other great beauties of leaf and flower, they add that of a straight stem. This a transplanted Hawthorn never will have, if the transplantion of it take place at too advanced an age. Five years old is quite old enough; for, if they be tall, the wind blows them on one side, and they become and remain leaning and unsightly things. If they do lean on one side, and cannot be easily restored to an erect position, they ought to be cut down to the ground, and a new stem suffered to come up.

279. The wood of the White Thorn, or Hawthorn, is very hard and compact; and, when it attains to any considerable size, it is used for most of the purposes which have been spoken of as those to which the wood of the Crab is usually destined. As *underwood*, it produces mere *bushes;* and it ought not to be suffered to interfere with the other underwoods.

THE HAZEL.

In Latin, *Corylus;* in French, *Noisettiers.*

280. The botanical characters are:—It has male and female flowers growing at remote distances on the same tree. The male flowers are produced in long scaly katkins, each scale including a single flower, having no petals, but eight short stamina fastened to the side of the scale, and terminated by oblong erect summits. The female flowers are included in the future bud, sitting close to the branches; these have a thick two-leaved perianthium, torn on the border, sitting under the flower when it is small, but it is afterwards enlarged to the size of the fruit; it has no petal, but a small roundish germen occupies the centre, supporting two bristly coloured styles, which are larger than the empalement, crowned by single stigmas. The germen afterwards becomes an oval nut, shaved at the base and compressed at the top, ending in a point.

281. This, which is one of our most useful underwoods, is the common *Nut-Tree*, which is too well known to us all to make any very particular description of its height, size, form, leaf, or any thing else belonging to it, necessary in this place. There are several varieties of the nut, amongst which are the Cob and the Filbert; but the whole are propagated and cultivated in the same manner; except that, if *fruit* be the object, you must propagate by suckers or layers, and not from the nut; for, if Cob-nuts or Filberts be sowed, the fruit of the trees which come from them will, in all probability, be nothing more than the common nut. I mention this incidentally, for these are matters of horticulture, and have nothing to do with the rearing of timber trees and underwood.

282. As *underwood*, the HAZEL is a very useful plant. It does not grow so fast as the ASH, as the BIRCH, as the CHESNUT, or as the WILLOW; but it produces a prodigious number of shoots from its stem: it will bear the shade better than almost any other underwood; and, though its shoots do not grow to *poles*, they make the best of rods, small hoops, hurdles, hethers to hedges, very good stakes, and are good for many minor purposes, particularly for the making of vent-pegs.

283. The HAZEL grows best upon what is called a hazle-mould: that is to say, mould of a reddish brown; but it will grow almost anywhere, from a chalk or gravel to a cold and wet clay; but the rods are durable in proportion to the dryness of the ground on which the Hazel grows, and they are particularly good where the bottom is chalk. I have, indeed, seen very beautiful coppices, with Hazel rods as thick as they could stand, in a soil not more than from four to six inches deep, a poor hungry soil too, lying upon a bed

of chalk. In the north of Hampshire are the finest coppices I have ever seen of Hazel: there, on the sides or on the tops of some of the bleakest hills in England, you see innumerable coppices of this wood, and generally very fine. The Hazel splits freely, and is, therefore, peculiarly calculated for hurdles and hoops; and, in the country last-mentioned, hurdles are made of split rods in the neatest manner.

284. The seed of the Hazel is the *nut*, so well known to every body in England. Some years these nuts are very scarce, but in other years they are altogether as abundant. In 1826, at the great fair of Weyhill, which takes place in October, it was supposed that there were more sacks of nuts (each holding four bushels) than there were at the same fair, pockets of hops, though from that fair the whole of the West of England is supplied with hops. In such a year, therefore, the nuts, when ripe, can be obtained at the expense of about twenty shillings a sack, when taken out of the green husks that cover them. A part of these will always prove bad, and will not grow; but, supposing a fourth part to be of this description, three bushels contain a prodigious number of nuts.

285. When you have the nuts collected, they ought, like the Beech nuts and Chesnuts, to be laid in the sun till *perfectly dry;* and then they ought to be put into dry sand, in the manner directed for the Beech nuts and the Chesnuts, to which the reader will be pleased to turn back. You ought to move them once every month, to see whether they have become damp; and if so, they ought to be put in a dryer place. The greatest care must be taken to preserve them, for they are very apt to spoil.

286. As to the SOWING, they might be sowed in ploughed

ground, which is intended to be the coppice, being sowed over the ground like wheat or barley, only more thinly, of course; and this would do very well, as it would in the case of many other trees, if there were any magic spell to keep the weeds from coming; but the nut-plant is a very tender plant when young, as tender as a radish, and is presently covered over by weeds; and perhaps by sowing a whole field of ten acres, you would not obtain ten trees.

287. Plantations must, therefore, be made from plants raised by sowing the seed. The manner of sowing the seed, and the time of sowing it, are, and for the same reasons, precisely those mentioned in the case of the Beech nut. The covering is to be of the same thickness, but the beds should be kept clear of weeds with still greater care; and, in pulling out the weeds, greater care should be taken not to disturb the plants, which, if thus managed, and watered now and then lightly in the evening in very dry weather, will be from four to seven inches high in the month of October.

288. They will come out of the seed-bed with a very bushy root, which will merely want tipping with a sharp knife; and then the plants are to be sorted, putting the strong ones by themselves and the weak ones by themselves, for the reasons before mentioned.

289. The distances in the plantation should, I think, be those of rows of five feet apart, the plants five feet apart in the row; the plants of one row coming opposite to the middle of the intervals in the other row. If the ground were very good, the distances might be still greater; for the Hazel stem spreads very widely, and soon fills up a great space. As to the cultivation of the ground, the cutting down of

the plants to form stems, the felling of the coppice, and the application of the crop, all are the same as those mentioned under the head of Ash; except that, in the case of the Hazel, no plants are ever left to become trees, and none are ever intended for poles.

290. Before a man plant a coppice, he ought to consider, and indeed he naturally will consider, the country the coppice is situated in, and the probable demand for the different sorts of the produce of underwood. Surrounded by the hop-grounds of Kent, or any other part of England where there are hop-grounds, poles will be his principal object; and then the Ash, the Chesnut, and, in wet situations, the Willow and the Alder, he will naturally look to as the things to plant. Near to great towns, Birch he will consider as a desirable article; in sheep countries, amidst the downs, where the folding of sheep is the great source of manure and of crops of corn, rods and hurdles will be the objects of his coppice; and here he will want Hazel, and here, too, he will find a sort of soil on which the best Hazel grows.

291. The Hazel coppice, like others, is cut down when the leaf is off, and the cutting always ought to cease by the first of March, and all coppices ought to be quite cleared by the twenty-fifth of that month. The age of the Hazel, when it will be fit for the purposes above-mentioned on dry ground, is from ten to twelve years; but it ought not to be cut till the rods are at the proper size. The whole of the rods will not be at that size at the end even of twelve years; but, if the coppice stand too long, the prime rods will have become too big: and thus a loss of time, as well as of crop, will have been occasioned.

THE HICKORY.

In Latin, *Juglans Tomentosa;* in French, *Hickorie.*

292. The botanical characters are:—It has male and female flowers at separate distances on the same tree. The male flowers are disposed in an oblong rope or katkin, which is cylindrical and imbricated, with spaces between the scales; each side has one flower, with one petal fixed in the outer centre, toward the outside of the scale. The petal is divided into six equal parts; in the centre is situated many short stamina, terminated by erect acute summits. The female flowers grow in small clusters, sitting close to the branches; these have a short, erect, four-pointed empalement, sitting on the germen, and an acute erect petal, divided into four parts. Under the empalement sits a large dry oval berry, with one cell, inclosing a large oval nut with netted furrows, the kernel of which has four lobes which are variously formed.

293. There are divers sorts or varieties of the HICKORY. MICHAUX counts no less than eight varieties of this tree; but the Americans make no distinction, except that of the SHELBARK HICKORY NUT and the HARD HICKORY NUT. The wood appears to be pretty nearly the same in them all. Some of the trees grow higher than the others; but the SHELBARK grows to the height of eighty or one hundred feet, but never with a very thick stem or trunk, seldom more than two feet or two feet and a half in diameter. The tree grows in America, in all sorts of ground, from the deepest and richest valleys to the highest and poorest hills. The tree, as an object to look at, is exceedingly beautiful, loaded with leaves of a fine airy shape, and of a bright green, turning yellow with the first frosts of the autumn, and hanging upon the tree as completely as if green, for a month or six weeks after they have become of a bright

yellow; having, as to its autumnal foliage, nothing to exceed it, except the Sassafras, which is still more thickly covered with leaves, those leaves still more beautifully formed, and their yellow of the autumn of a brighter dye.

294. The wood of the Hickory is not good for buildings, but it is excellent for a great many uses: for the making of tool-handles of all sorts; for the making of fishing-rods, of whip-handles, of handspikes, and of every thing which requires great hardness and toughness. Michaux gives instances of it having lasted under water for a great number of years; and I have a piece of wood now in my possession, recently sent me from New York, a certificate attending which shows that it had been under water for more than FIFTY YEARS. For toughness and suppleness, this wood surpasses all others. The back-bows of wooden chairs are made of this wood, not of a young tree, but of a piece cut out of a plank. The great broad hoops that go round the masts of ships are made of Hickory wood, first sawed out of a plank, then planed; and the best wooden hoops in the world, for barrels and tubs, are made of Hickory. So tough is this wood, that, in New England, they take thin strips of it, and work them together into *well-ropes* and *clothes lines*, one of which last I bought when I was last in America. It is used for axletrees for carts and waggons. It may bend, but it takes a weight or a force of an extraordinary nature to break a piece of Hickory as big as one's wrist. This tree has been so hunted after for its various uses, and especially as fuel, of which it is the best that ever was known, that Michaux seems to think that the whole race will be destroyed in America in a very few years; and indeed, where there is navigable water leading to a considerable town, the slaughter of this tree has been without mercy.

295. As underwood, the Hickory would be invaluable as *hoops*. It is made use of, as I said before, for all purposes where toughness and suppleness are wanted; for tool-handles, cogs of wheels not exposed to wet; for the wood does not last long, if exposed at the same time to the air and wet. It is used for the teeth of wooden rakes and harrows, and its surpasses our Crab in clubs, walking-sticks, and the swingles of flails. It is always used in bows of ox-yokes. You must absolutely beat a stick of it to pieces. It will come to pieces in little shreds, in time, but nothing will break it. It is employed, above all things, for wooden hoops of every sort; and it is always used, where it can be obtained, in the forming the hoops of casks and boxes, for which purpose immense quantities are used in the United States, and exported to the West India Islands. These cask-hoops are made of young Hickories coming from the seed, and cut down at the height of from six to twelve feet, without any choice as to the different varieties of this tree. My barrels come from America with hoops sometimes made of young Hickories and sometimes of the White Oak: the Hickories, however, Michaux says, are the best for this purpose; because, although the White Oak is equally elastic, it is more apt to peel off in small shreds.

296. A Hickory coppice would be an invaluable thing in England. When cut down the first time, the stems would send out two and three shoots; and if the distances were as directed for the Ash or the Birch, the produce of an acre would be from fifteen to twenty thousand hoops. It is said that the Hickory is of *slow growth* when young; but this slowness of growth is only for the first two or three years: for I have one now at Kensington, which has been sowed five years, and which is now above seven feet high. They might be planted in coppices at three feet apart,

which would give 4840 plants upon an acre. If these plants were properly treated, they would, at the second cutting, yield from 20,000 to 40,000 hoops; because each rod is always split into two, and therefore makes two hoops.

297. The plants should not, in this case, be cut down until the second year after planting; because, having so few fibres, and being so difficult to cause to strike, the plants do not get good root till the second year. When cut down, they would go up with a straight stem, and, in ten years, or thereabouts, would make good hoops. No other trees should be planted with the Hickory, because these latter grow so slowly at first, that the others would overshadow them and keep them in a state of subjection.

298. Now, as to the manner of propagating the HICKORY, it is only by seed; and that seed is neither more nor less than a little WALNUT, having a shell of different degrees of hardness, in the different varieties of the tree. The form of this WALNUT, too, differs with these different varieties. The seed never, I believe, ripened in England; but it is easy to be obtained from America, anywhere to the south of the Province of Maine. These little Walnuts ought to be sown as early in the year as possible; for, if sown late, many of them will not come up the first year. The manner of sowing is precisely that of the ASH; only the nuts, when laid upon the bed, should be patted down heavily with the spade, before they be covered; so as to fix them firmly in the ground, and to prevent them from being washed out with heavy rains, or disturbed by worms.

299. As to the preserving of the seeds, they may be tossed into a barrel like so many stones, and kept in any place where they are not absolutely wet. When the plants are

up, they should be kept carefully weeded, during the summer, at the end of which they will have attained the height of about four inches: they should then be put into the nursery, in the manner directed for the Ash; but, in this case, the work of removal must be performed in the month of October, or early in November, and with uncommon care. Though the plants will only be about four inches high, the tap root, if you take it to its very point, will be a yard long on an average, with very short fibres coming out on the sides of it. You must cut this tap roots off, so as to leave it but eight inches long; leave it as little as possible exposed to the sun and wind, and then put it into the nursery in the manner directed for the Ash, but with still greater care. It must stand *two years* in the nursery; and then it may be removed into plantations, in the manner directed for the Ash, but always with still greater care.

THE HOLLY.

In Latin, *Ilex;* in French, *Houx.*

300. The botanical characters are:—It has male, female, and hermaphrodite flowers on different plants. The male flowers have a small permanent empalement of one leaf, which is indented into four parts; they have but one petal, which is cut into four segments, almost at the bottom; they have four awl-shaped stamina, which are shorter than the petal, and are terminated by small summits. The female flowers have their empalements and petals the same as the male, but have no stamina; in their centre is placed a roundish germen, having four obtuse stigmas sitting on it. The germen afterwards becomes a roundish berry with four cells, each containing a single hard seed.

301. All those who are old enough to know what *Christmas* is, know what Holly is. As the French chose the "*Poplar tree,*" which in their language is called "*Peuplier,*"

as their *tree of liberty, Peuplier* seeming to have something in its sound that was partial to the people; so, in ancient times, in this country, when men had a little more real religion than they have now, the Holly, which has but an "l" too much to make it *holy*, and which is the gayest object in the woods and groves in the month of December, was chosen as the symbol of rejoicing at the anniversary of the birth of the Redeemer. From this cause, the outward appearances of the Holly are known to millions, perhaps, of unfortunate smoke-dried creatures, who never saw the dew in the whole course of their lives, and to whom the Aurora is totally unknown, except from the writings of the poets; and, from the description which some of these have given of it, one would think that they themselves never could have seen the object they describe.

302. The Holly is certainly a most beautiful tree, and if care and patience were exercised with regard to it, it would become lofty and of straight stem, as well as of beautiful foliage. It has a white insignificant blossom, which is followed by bunches of berries, first green and then red, each berry containing three oblong seeds as hard as a stone. These seeds must be gathered in the month of November, or the birds will take every one of them away, especially if there come snow. The Holly berry seems to be a sort of *pis aller* with them; but they will fall on them when they can get nothing else.

303. The seeds, or rather the berries, as soon as collected, must be mixed up with damp sand, three portions of sand to one of berries; and, after having been kept in that damp state, in a cellar or some such place, for one whole year, they are to be sowed in the manner directed for the seeds of the Ash. They will sometimes not come up till the third

year, and then they must stand two years in the seed-bed, for they are still too small to be removed until then. They must be moved into a nursery, and finally into hedges, or into shrubberies, with all the care and all the precaution pointed out in the case of the Cedars.

304. The wood of the Holly is very hard, very close and fine-grained, and serves for many purposes where it is found of considerable size. It is used by cabinet-makers; takes a very brilliant polish, and is employed for inlaying mahogany furniture. It is good for the purpose of turnery, and for making light screws, and Michaux tells us, that in America it is sometimes used for the pulleys or blocks of ships; but, in that country the tree grows larger, though its outward appearances are not very different from those of our tree. I have seen the Holly in both countries flourishing in every sort of soil, and generally I have seen the American Hollies much larger and more lofty than ever I saw it in England. Its principal use is the making of *hedges*, for which purpose it is excellent, at once the most ornamental, giving the most complete shelter, and forming the most effectual barrier against even the smallest of animals, of any fence consisting of trees or shrubs. To form a hedge, the Hollies should be planted at the same distances, and in the same manner, as directed for those of the Hawthorns; but, like other evergreens, should never be moved, except early in September or in April.

305. This tree is found in most of our coppices in England. When it produces long and straightish sticks, they are put by for whip-handles, being very tough in their young state. The stouter sticks are laid by for walking-sticks, or for swingles for flails, and the brush goes to the making of dead hedges, in which it will lie, with its leaves not perished,

for three or four years. The HOLLIES should be cut down, not the first but the second year after they be planted out, because they do not strike readily, like the greater part of deciduous trees; and, in the pruning of the roots, follow the directions given in the case of the FIRS; for here, the fibres are not to be cut off, but only the points of the long and straggling roots; and the plants ought to be kept out of the ground, at every removal of them, as short a time as possible.

THE HORNBEAM.

In Latin, *Carpinus;* in French, *Charme.*

306. The botanical characters are :—It has male and female flowers, growing separately on the same plant. The male flowers are disposed in a cylindrical rope, or katkin, which is loose and scaly, each scale covering one flower, which has no petals, but ten small stamina, terminated by compressed hairy summits. The female flowers are disposed in the same form, and are single under each scale; these have one petal, which is shaped like a cup, cut into six parts, and two short germen, each having two hairy styles, crowned by a single stigma. The katkin afterwards grows large; and, at the base of each scale is lodged an oval angular nut.

307. There are three or four varieties of the Hornbeam, one of which, which comes from America, is called IRON WOOD (*Carpinus Ostrya*); and in England it is called the HOP-HORNBEAM, because its seeds come in a sort of cone, very much resembling a rather small and oblong hop. This, however, is an ornamental shrub, and, of course, does not come under our present inquiries. The common HORNBEAM of America very much resembles our own in all respects, but MICHAUX says, that it is better for hedges, or, at least, more ornamental, as its branches are more numerous, and as its foliage is closer and more tufted.

308. The use of this tree is to form lofty hedges for the sheltering of kitchen gardens, and other such purposes; the wood is very close and hard, and fine grained, and is sometimes used by turners for various purposes. It is also very good as fuel; but the tree rarely attains any considerable height or bulk; and its great use is for the forming of hedges; its shoots being so slender, and so numerous, that they admit of clipping like the hedges made of Hawthorn, and a hedge, if well managed, may be kept thus from twenty to thirty feet high; and the leaf being very beautiful, and adhering to the tree almost through the winter, here is ornament as well as use.

309. The SEED is very hard: it should be carefully collected in the fall of the year, when ripe: if sown directly, part of it might come up the first year; but the best way is, to keep it one year out of ground, precisely in the manner directed in the case of the Ash seeds, in paragraphs 107 and 108; and they should be sowed, in the time and manner directed for the sowing of the Ash seeds in paragraph 108, and the following.

310. The young plants come up with two little round leaves, not so big as those of the smallest of the turnips; and great care must be taken to keep them clear of weeds. They do not attain the height of more than four or five inches the first year, when they ought to be moved into the nursery, in the manner directed for the Ash. They ought to stand in the nursery two years; for they are but slow growers at first. They are to plant as hedges, or as independent ornamental trees. If the latter be intended, they should have the ground well trenched for them, and made rather good. There ought to be two rows of plants to form the hedge, if it be intended to become lofty; the plants

should be two feet apart in each row, and those in one of the rows should stand opposite the interval of the other row. The whole of them should be cut down to the ground the year after being planted. The main shoot of each plant ought to be suffered to go upright, and the side shoots, instead of being pruned off, should, on each side, from the very ground, if possible, be worked in a horizontal direction, along amongst the uprights of the neighbouring plants. In a year or two, you begin to clip with the shears at the bottom of the hedge; and, as the hedge mounts, you keep twisting in the side shoots, and clipping the points, until you have the hedge to the height you wish, when you make the top either like the ridge of a house, or flat, as may best suit your taste. The hedge, like that of the Hawthorn, should be clipped twice a year; in the winter, and about the middle of July. Having omitted to mention this under the word Hawthorn, I mention it here as worthy of particular attention.

THE LARCH.

In Latin, *Larix;* in French, *Melose.*

311. The botanical characters are:—Male and female flowers, growing separately on the same tree. The male flowers are disposed in a scaly katkin; they have no petal, but they have a great number of stamina, which are connected in a column below, but are separated at their points, and terminated by erect summits. The female flowers are disposed in a conical shape, having no petals; these are placed in pairs under each scale, having a small germen, supporting an awl-shaped style, crowned by a single stigma. The germen afterwards becomes a nut, with a membranous wing inclosed in the scales of the cones.

312. This is a tree about which there is not much to be said by me; because, whether as to the manner of collect-

ing, of getting out of the cone, or of sowing the seed; whether as to the manner of removing the plants into the nursery, of putting them in plantations, of managing them in those plantations, of thinning them out into the plantations, or finally as to cutting them down as timber, every thing said under the head of "The Fir," is equally applicable here; and, therefore, I have only to request the reader to turn back to what has been said under that head.

313. But there is one use to which Larches are put, and to which the Fir can scarcely ever be applied; namely, that of Hop-Poles, of which it makes not bad ones, when the tree has attained a height, so as to make it about an inch and a half through at twenty feet from the ground. This pole is said to last as long as that of the Ash; but it has the fault which I mentioned under the head of Chesnut, that of being too big at the butt in proportion to its height. I am so decidedly of opinion that it is far more profitable to plant Ash for this purpose, and more especially the Locust, as we shall see by and by, that I do not recommend the planting of Larch for the making of *Hop-Poles*. If planted for that purpose, however, the plants should not stand at more than three feet apart, and should be kept pruned up on the sides, as directed for the Fir and the Chesnut, these being the means of keeping the butt of the pole nearer proportioned in size to the point of it. But the disadvantage of employing ground in this way, for the purpose of obtaining poles, must be evident to every one who considers that, at three feet apart, an acre will contain only 4480 poles; that the Ash or the Locust will, if you please, contain just the same number at the *first crop;* and that the Larch, when once cut down, never shoots again; while the Ash or the Locust will give you, in all probability, from ten to twenty thousand poles out of the stems which

you have left in the ground; so that, at about three cuttings, either of the two latter will have given you about *forty thousand* poles on the acre, while the Larch will have given you only 9680 poles; and, to obtain these, you must grub the ground, trench a second time, and make a new plantation of Larches. The trees are pretty, and they make good timber when they are large. They are ornamental, but they yield to many other trees even in that respect; and, as poles, it can never be profitable to plant them, especially when the Birch, the Ash, and the Locust, and particularly the first and the last of these, will thrive anywhere where the Larch will thrive; and though the Birch does not make a good pole, it makes many other things of as great and more general utility.

THE LIME.

In Latin, *Tilia;* in French, *Tilleul.*

314. The botanical characters are:—The flower has a concave, coloured empalement, which is cut into five parts; it has five oblong blunt petals, which are crenated at their points, and many awl-shaped stamina, terminated by single summits, with a roundish germen, supporting a slender style the length of the stamina, crowned by an obtuse five-cornered stigma. The germen becomes afterwards a thick globular capsule with five cells, opening at the base, with five valves, each containing one roundish seed.

315. There are several varieties of the Lime, and the Common Lime in England is too well known to require any description as to its outward appearances. It is well known to attain a great height, to be very beautiful in its foliage in the former part of the summer; to have a leaf, however, that dies early, that becomes rather ugly by August, and that litters the ground all over by the month of September. This tree, which is never placed in plantations

for timber, and which is not worth a rush as underwood, is merely an ornamental thing, having a soft white wood, used sometimes in toy-turnery, and for some other purposes of no great consequence; but the tree is greatly ornamental, grows fast, and stands erect, especially if raised from the seed.

316. The SEED of this tree is a little kernel of the size of a very small pea, contained within a hard and toughish shell, which shell is covered with a slender pulp. The seed does not always ripen in England, but it sometimes does, in very fine and hot summers; and it may be gathered early in September, in very great abundance, and with the greatest possible ease.

317. MILLER, after giving directions for raising this tree from *layers*, says, that "if the tree be *intended to grow large*, to raise from *seed* is the best way." The matter for surprise is, that any one should ever raise a LIME from a *layer*, seeing that it is always intended to grow large, that it is wanted for its height, and the mass of its foliage, to make a stately appearance in avenues, in clumps, or in independent trees; therefore, I shall give particular instructions relative to this mode of propagation.

318. The time of sowing is the same as that of the ASH (paragraph 108), only with a covering a little less deep. The seed, when collected, should be made perfectly dry in the sun, then mixed with very dry sand, and kept in that state until about the month of August after it is collected. The mixture may then be moistened a little, and kept frequently turned; and the sowing should take place in November, lest the seed should begin to sprout in the heap. If you sow in the November after you have collected the

seeds, *some* of them will come up, but, perhaps, not one out of fifty. I have several beds of American Limes which I sowed last March (it is now the 2d of March, 1828): not a seed came up; but I have examined the beds, and believe all the seeds to be sound.

319. When the plants come up, they will appear, as they are, very tender, and the beds must be scrupulously kept clear of weeds. It is a very bushy-rooted plant, takes root with the greatest facility, and should be moved into a nursery at the fall of the year, in the same manner as directed for the Ash, in paragraphs 120, 121, and 122. In this nursery the plants may stand a year or two, having been assorted, as mentioned in the case of the Ash; and, as Miller justly observes, if you mean to have a fine, a straight-trunked, a lofty, and a long-lived tree, you must not only raise from the seed, but also plant the tree out where it is finally to stand while it is *young*, certainly not more than three or four years old. If you plant in parks, or in any place where cattle go, you must fence round the trees effectually; for, if once cropped, the trees will never be beautiful; and if only the side shoots be cropped, the cropping will disfigure the tree, and prevent it from thriving.

320. If you wish your tree to branch out from the bottom, as people generally do, when the trees are planted three or four in a clump, or as independent trees, you must, of course, refrain from cutting off the principal side shoots; but if you wish it to have a clear stem to any considerable length, you must prune in the manner directed for the Beech. When Limes are cut down, they send out great numbers of young shoots from the sides of the old stem; but these never arrive at anything more than the forming of a sort of bush; and the stem, with all its branching

roots to their utmost extent, ought to be grubbed up and taken out of the ground, making room for something else to grow.

321. There are two sorts of American Lime: the White Lime (*Tilia Alba*) and the Downy Lime (*Tilia Pubescens*). These Limes, according to Michaux, do not rise to a height, in general, equal to ours; but, as ornamental trees, they very far surpass ours. In America, they are both called by the name of *Bass Wood*, from the circumstance of the inner bark being so excellent for the yielding that stuff of which our garden mats are made. The wood of the American Limes appears to be that of ours; but the trees have this great advantage over ours, that the leaf is larger in the White Lime, is of a more ornamental shape, and preserves its bright green until the frosts come. The other tree, the Downy Lime, is still more ornamental, the leaves being of a very bright and beautiful green on the upper side, and pretty nearly white on the under side. The manner of propagating and of managing these trees, is, of course, the same as directed for the English Lime; the same objections to the raising from *layers* apply here also. It is surprising that people should not raise from the seed, seeing that it is so much *cheaper*, as well as better in every respect. I can never too often beseech the reader to remember, that a *layer* is a BRANCH of a tree; and that it is against nature to expect a tall and handsome tree, with a regular trunk, diminishing from the base upwards, to come from a branch. Accordingly, we see them in the nurseries requiring everlasting attention, to prevent their growing into forks and becoming bushy-headed. After all, they are but poor scrubby things, full of knots and burrs from the frequent cutting about, and the wonder is that they ever make any figure at all.

THE LOCUST.

In Latin, *Robinia Pseudo Acacia;* in French, *Acacie.*

322. The Botanical characters are:—The empalement of the flower is small, of one leaf, and divided into four parts; the three upper segments being narrow, but the upper one is broad. The flower is of the pea-bloom kind. The standard is large, roundish, obtuse, and spreads open. The two wings are oval, and have short appendixes, which are obtuse. The keel is roundish, compressed, obtuse, and is extended the length of the wings. In the centre are situated ten stamina, nine of them being joined together, and the other standing single, terminated by roundish summits. It has an oblong cylindrical germen, supporting a slender style, crowned by a hairy stigma; these are inclosed by the keel. The germen becomes afterwards an oblong compressed pod, inclosing kidney-shaped seeds.

323. This is, in my opinion, the tree of trees; it was, at any rate, my desire to see this tree introduced into *general* cultivation in England, that induced me to import the seed and to sell the plants here; and that led, also, to the writing and the publishing of this work. I shall, therefore, leave in this article nothing unsaid that I know upon the subject; and I believe I know as much on this subject, and perhaps more, than any man in the world, and particularly as to the *propagation of the tree,* which, when I have given the fullest possible account of the valuable properties of the tree, I shall make as easy to the reader as is the rearing of cabbages or turnips; and that, too, at an expense so moderate, as to make it next to impossible for any gentleman, who has the seed, to refrain from cultivating this tree upon as large a scale as his possessions will permit.

324. There are several varieties of the ACACIA, distinguished by the difference in the size of their leaves, by that in the colour of the blossoms, by that of the size and shape of the seed-pod, and by the size and shape of the seeds themselves. Some of these varieties, according to MICHAUX, yield but very indifferent timber, though they differ but very little in the size and shape of the leaf, and in the size and look of the tree itself. One of these is called the *Yellow Wood*, in America; another is called the *Sweet Locust;* another is called the *Water Locust.* I have seen several trees, in England, of a Locust differing in appearance and in blossom but very little from the Robinia; but the wood of which, as MICHAUX says, is good for very little; so that the greatest care must be taken, as to the variety of sort which is sowed.

325. This tree was first introduced into Europe by J. ROBIN, a French botanist, who received it from Canada, and cultivated it in France in the reign of HENRY the FOURTH. —"To commemorate the introduction of so valuable a "tree," says MICHAUX, "and to express the acknowledg- "ments due to the person who had conferred this benefit "upon the old continent, LINNÆUS gave the genus to which "it belongs, the name of ROBINIA." This, therefore, is that particular sort of LOCUST, which word LOCUST is used by MICHAUX because it is the name given to the tree by the inhabitants of America, who had a right to give it what name they pleased; and which name I use, not only for that reason, but to prevent any person, sending to America either for timber or for seed, from being disappointed, there being hardly one man in twenty thousand who knows the tree by any other name. It is curious that MICHAUX, in speaking of the fine trees which he had seen in America of this sort, should mention those which he saw near HARRIS-

BOURGH, in Pennsylvania, it being from that spot that I have always received my seed; and that part of Pennsylvania being the most famous in the whole continent for this sort of timber. HARRISBOURGH is situated on one of the banks of the Susquehannah River, and there, by the bye, is a *suspension bridge*, built principally of Locust wood, stretching across a river more than a mile wide, and under which, vessels of no very contemptible size pass without lowering their masts.

326. The outward appearance of this tree, its beautiful leaves and flowers, are pretty well known in most parts of England; but it remained for me to make known the properties of the wood. These properties, too, are in part mentioned by MILLER; and its surprising powers, when constituting parts of ships, are mentioned at full length in HUNTER'S edition of EVELYN'S SYLVA. Notwithstanding this, we never heard of a man in England that ever planted this tree, until I took the matter in hand, except as a thing of mere ornament, in which respect it certainly surpasses any other in the world, but as such I should not have deemed it worthy of notice. I have, at different times, written and published upon this subject, through the channel of the REGISTER, in which I began by producing certificates relative to the durability of the wood. I shall, by and by, publish those certificates, which I collected, or, at least, I paved the way for collecting, while I was in Long Island, from the month of May, 1817, to the month of October, 1819; a space of time that I was in voluntary banishment, for the purpose of avoiding those dungeons into which such numbers of the public-spirited and virtuous reformers were put, deprived of the use of pen, ink, and paper, and from which they were finally released (those of them who survived their sufferings) without any charge

having been preferred against them from the first to the last. Nevertheless, I did not forget my country, and the duty I still owed to her. I was convinced that nothing in the timber way could be so great a benefit as the general cultivation of this tree. Thus thinking, I brought a parcel of this seed home with me in 1819, but I had no means of sowing it until the year 1823. I then began sowing it, but upon a very small scale. I sold the plants; and, since that time, I have sold altogether more than a million of them.

327. In other places I have said quite enough upon the properties of the wood, upon the uses for which it serves, upon the quickness of the growth of the tree, and also upon the manner of planting it. All that I have said before must, however, be *repeated here;* for, besides that new readers are every day rising up, this is the book, this is the part of my labours, where every one who cares anything about them will look for what I have to say relative to this tree; for the manner of collecting and preserving the seeds of which, and also of the manner of sowing which seed, I have no where, as yet, given a full and detailed account; and yet it is very material to give that account. I shall, therefore, first repeat what I have said before, on the properties of the wood; then on the quickness of the growth of the tree; and then I shall lay down the plainest possible directions for the sowing of the seed, and for the managing of the young plants.

328. The wood is very hard, and close and heavy; it is yellow, almost as box; as hard as box, but the grain not so fine. The *durability of this wood* is such, that *no man in America will pretend to say that he ever saw a bit of it in a decayed state.* This seems hyperbolical; but every American of experience in country affairs will, if appealed to,

confirm what I say. It is absolutely indestructible by the powers of earth, air, and water. Its strength far surpasses that of the very best of our Spine Oak. It is to this timber that the American ships owe a great part of their superiority to ours. The stantions round the deck are made of Locust; and, while much smaller than the stantions of Oak, will resist a sea three times as heavy as the Oak will. The tiller of the ship is made of Locust, because it demands great strength and is required not to be bulky. For the same reason, the martingales of ships are made of Locust. The Locust is rather a rare timber in America; but sometimes the *futtocks* or *ribs* of ships, are made of Locust; and if a ship had all its ribs, and beams, and knees of Locust, it would be *worth two common ships*. Further, as to ship-building, that important article, the TRUNNELS, when they consist of Locust, make the ship last, probably, twice as long as if the trunnels consisted of Oak. Our Admiralty know this very well, or at least they ought to know it. These trunnels are the *pins*, of which so many are used to hold the side-planks on to the timbers of the ship. Trunnels is said to be a corruption from tree-nails; but I do not believe it. However, we know what these things are: we know that they are an article of the very first importance in ship-building; we know that the *hardest of our Spine Oak* is picked out for the purpose; and, with all that, we know that the trunnel is the thing that rots first: for the water, or, at least, the damp, will get in round the trunnel, and between it and the plank; and if water or damp hang about Oak, the Oak *will rot*. All the American *public* ships are built with Locust trunnels, and so are all the merchant-ships of the first character.

329. Some of our own public ships have, I fancy, Locust trunnels brought from America; and I have been informed,

that when Cropper, Benson, and Co., of Liverpool, built their East Indiamen, they imported the Locust trunnels and some other of the timbers from New York. We have a monstrous deal to do, in many respects, to make our navy (gun for gun) a match for that of the United States; but if we had accomplished every other point, there would still remain want of timber, unless we supplied ourselves with the Locust, at the least. The Hickory we should want for handspikes, for mast-hoops, and other hoops to go round the yards and stays. Various other things would be wanted to make our ships as light and as roomy as those of the Americans, and with the same degree of strength; but, without the Locust, it is impossible to match them.

330. But, important as these matters are, these are, by no means, to be compared to the various uses about *buildings* and fences. I have said that this wood is indestructible by the elements, except that of fire. How many thousands of houses are rendered useless in England, every year, by that thing which they call the dry rot, proceeding solely from those villanous soft woods, which impatient people take such delight in planting, and which carpenters of delicate constitution take such delight in sawing and planing. English Spine Oak is stronger than Deal; and if you keep it dry, it will not rot; but let it lie in the wet, or damp, and let the air get at it at the same time, and no villanous Deal board will turn to earth more quickly. Window sills of the best of Oak will rot, if something be not done to keep away the wet from getting under them: and in this very way the dry rot has got into many a house. Oak *door* sills are rotten in a very short time. The ends of beams and of joists, if they rest upon brick or stone, where the moisture is constantly about them, rot in a few

years. The points of rafters, and the pins which hold rafters together, are always rotting. If these things were made of Locust, your house would be safe for ages. Every where, when you want something to lie sopping in the wet, and at the same time to be exposed to the air, you should have Locust. Endless are the uses to which it might be put. A bottle-rack, for instance, that you want to stand out of doors and hidden in some corner, a grindstone-stand, a horse-block; but, particularly, a cart-house, or anything that requires *pillars*, the *bottoms* of which are to go *into the ground*. Go into any farm-yard in England; I do not care what farm-yard it is: and you shall find, in the cart-house, one of these things: first, the posts that support the buildings rotting off very fast, just where they meet the ground; second, those posts rotted off and cut *off*, and some stones put under them, to the manifest risk of the cart-house; third, the cart-house actually tumbling down in consequence of the rotting off of the posts. This is notorious; every farmer, every landlord in the kingdom, knows it. Now, I will insert a note from my memorandum-book, under date of October 16, 1819. "At Judge Lawrence's, at Bayside, "I saw a new cider-house, built against a hill, the upper "story of it supported in front by some Locust posts. These "posts, the Judge told me, had stood for *forty years*, or "rather better, as the posts of a *cart-shed*." They were as sound as they had been the first year they were cut down. In our stables in England, you see stones put at the bottom of the stall-posts. What a plague it is! Little Locust trees, only about seven years old, would, for these purposes, make posts that would last for ever. Every one knows how the *sleeper* (as I think they call it) rots; that is to say, the piece of wood that goes along at the bottom of each side of the stall. We know, also, how the manger-posts rot off at

the ground. Use Locust timber, and it will wear out the stone walls of the building.

331. I should fatigue the reader were I to enumerate only a tenth part of the uses of this timber; but, in short, if the timber be *imperishable*, what need of anything more in its praise? Will, however, English people *believe* in this imperishability? I would not believe in such a thing, if no *proof* were produced; and, therefore, I will now proceed to the proof of the truth of what I have stated. The test of imperishability is the situation of a *post* or *sill*, being exposed to air and water; or, rather, it being so situated as to *lie sopping in the wet*. I was led, by circumstances to be stated, by and by, to entertain, while I was last in America, an anxious desire to introduce this valuable tree into England. After I had resolved to return in 1819, I set myself to work to get some seed together, which I found to be no easy matter; for the Locust tree is by no means abundant in any part of America where I have lived; but, how to go to work to persuade English people that a little tree, chopped down, and put into the ground as a gate post or pale post, would stand there for a hundred years without rotting at all! How to persuade English people to believe this; and to believe, of course, that there was a timber about a hundred times as good as their heart of Oak! You shall hear how I went to work to endeavour to effect this.

332. In the latter end of August, in the year just spoken of, I was at Plandome, the farm and residence of Mr. JUDGE MITCHELL, in Long Island. He was building a new house on the spot where had stood the house of his grandfather. There had been a little sort of lawn before the door, enclosed by a pale fence. The fence had all

been pulled up, and there it lay, posts and rails and pales. I asked the Judge how long the posts had been in the ground. He said *eight-and-twenty years.* Each post had been a little tree, just chopped down, sawed off to the proper length, and squared, and each containing about *half a foot of timber.* They were all as sound as they had been the first day that they were cut down; and even the little sharp edges left by the *axe-chops,* at the part where the square part met with the un-squared part: even the little axe-chops were sound. The Americans use what they call *stakes,* to hold on the top-rail of what they call a worm-fence. These are generally made of little limbs of trees, about eight feet long, and about the bigness of a hop-pole. I saw many of these at Judge Mitchell's on that day, which he assured me had been standing as stakes for upwards of *thirty years.* I hinted to the men of Kent that I would teach them how to make everlasting hop-poles; and this is a duty that I particularly owe to my native town of Farnham, so famous for hops.

333. On the 25th of October of the same year, 1819, I was in company with Doctor Peter Townsend, at Mr. Judge Lawrence's, at Bayside, in the township of Flushing, Long Island. I was talking to them about this Locust-tree project; and here I cannot refrain from making an observation which I have more than once made in my Year's Residence; namely, that, say what they will of the selfishness of Jonathan, I say that he is the most truly liberal of all mankind. At home, he never grudges his neighbour his good fortune; he is always made happy by his neighbour's success and prosperity: and, as to foreign nations, he is always anxious that they should possess all the products, all the inventions, all the improvements that he himself enjoys. In conformity with this most amiable dis-

position, my excellent friends at Bayside entered into my views, about introducing the Locust into England. The Judge showed me a post, which he said must be nearly a hundred years old as a post. This post had been cut down, when a little tree, and it had served in the capacity of what they call a hog-gallows post. I examined it very minutely, and I found it perfectly sound, even to the very tips of it. It was a post with a fork at the top of it. The points of the fork had been chopped off in a careless manner; and there were these points perfectly sound. But the main question was, how was the post *where it met the ground?* It was just as sound there as it was in any other part. It had stood in a *gutter*, observe, for all these number of years. The water thrown to wash out the hogs had run down the gutter, and had soaked down about the post. The numerous sweepings and shovelings of the gutter, to take away the blood and the mud, had *worn away* the post a little, as they would have worn away iron; but still it was as sound as on the day when it was *felled*.

334. Judge Mitchell was so kind as to give me a memorandum, signed by himself, relative to this post; and Judge Lawrence, not being so old as his brother Henry, we sent for the latter, and he signed a memorandum, relative to the hog-gallows post. I dare say that every reader, who delights in rural concerns, and who duly considers the vast importance of this matter, will lament that he, also, could not see these posts. If he happen to be in London, HE MAY SEE THEM NOW; for they are to be seen by any body at the Office of the Register in Fleet-street. The Manchester Magistrates brought out horse and foot to prevent me from passing through their town. The Bolton Magistrates put John Hayes in prison, for ten weeks, for announcing that I had arrived at Liverpool in good health.

But my Locust posts came safely to London, and I came soon after them, with the following memorandums in my pocket.

Plandome, 23 *August*, 1819.

335. I have this day given to William Cobbett a Locust post six feet long, and squaring three inches by three and a half, which is perfectly sound in all its parts, and which has stood in the ground, as part of a fence, in front of my house, from the year 1791 until about five weeks ago, when the fence was taken up.

Singleton Mitchell.

Bayside, Flushing, 25 *Oct.* 1819.

336. My brother, Effingham Lawrence, has this day taken up out of the ground, and given to William Cobbett, a hog-gallows post; that is, a post having a fork at the top, for the purpose of lodging a pole on, and on which pole hogs are, when killed, hanged up by the heels. This post is of Locust Wood; it was a single tree, and the whole of the lower part of that tree; it is, from extreme point to extreme point, eight feet eight inches long; from the tip of one fork to that of the other, from outside to outside, it is seventeen and a half inches; there is a knot, the middle of which is fourteen and a half inches from the end of the butt; there is another knot eleven inches from the middle of the fork; the circumference of the post, at the mid-distance from the ends, is eighteen inches. I have known this post standing as a hog-gallows post during *forty-four years*. When I first knew it, it was a very old post. I remember hearing my father say, that it was a *wonderfully old* post then. I should suppose it to have been a post upwards of *fourscore years*.

Henry Lawrence.

337. I have before mentioned, that Doctor Townsend was with us at Bayside. The Doctor was acquainted with a Mr. Smith, of Smith's Town in Long Island, and he had heard that there was a Locust post at Smith's Town, which could be proved, by unquestionable testimony, to have stood, without injury, for upwards of a hundred years. I begged of the Doctor to get me proof of this, and to send it to me to England. This he did, very punctually, as will appear from the following documents.

TO DOCTOR PETER TOWNSEND.

338. *Smith's Town, Long Island, 25 Feb.* 1820.

DEAR SIR,—Yesterday morning I received the letter which you mentioned having written me of the 22d, on the subject of the posts, to which I had certified, on the evening of that day, at the Judge's. I observe by an extract of Mr. Cobbett's letter, quoted by you, that he is desirous of further information, and mentions something of obtaining the post. This memento of antiquity, though not intrinsically worth six cents, I would hardly part with for its weight in silver; but such information as I can give you is cheerfully at his service. There are many Locust posts in my post-and-rail cross-fences, put in by a former proprietor of the farm, who has been dead about twenty-six years; probably some of them have been standing fifty years or upwards, most of which are at this day in a perfectly sound state above and below the surface of the ground. Since residing on this *farm* (about three years since), I have taken down an old barn which had been repaired by putting in new sills and other parts of its foundation, under, as nearly as I can ascertain, about forty-one or two years ago. One of these sills was of Locust, about eight inches square, which, by the inattention of the proprietor, had been buried many years under the dirt and filth which invariably collect about such buildings; the foundation timbers had all disappeared, and some of the posts rotted and entirely decayed two or three feet above the base, when I took possession here eleven years ago. In removing the dirt to manure my garden, about two feet below the surface, I came to the Locust sill. While the other timbers had all mouldered down, and some of them so far incorporated with the dirt as scarcely to be distinguished or known from it, the Locust was in so perfect and uninjured a state that I had a *pair of axletrees made from off it for a wagon, which are now doing good service.* I recollect my father's cutting a quantity of large Locust timber for market, some of the limbs of which were converted into posts to put up a board fence near the house. This fence I assisted in making: one side was flatted to receive the board, and the posts set into the ground, with the natural bark on, for about twenty-eight inches. Fourteen years afterwards, and after my father's decease, in making a new disposition of the ground, I was present when my brother Ebenezer took up these posts. There was very little visible decay even of the bark, and the wood, when stripping the bark off, had the appearance of being just felled. Many instances might be given of the durability and usefulness of this very valuable timber. So sensible are we, in this quarter, of its great worth, that every farmer of common prudence is taking the utmost pains to cultivate it, when and wherever he can. Should you make any further communications to Mr. Cobbett, I beg you will tender to him my best wishes for the health and happiness of himself and his family. With sentiments of much friendship and esteem, I am,

Your obedient and most humble Servant,

RICHARD SMITH.

339. CERTIFICATE.

THERE is a Locust post standing on the road side, about sixty yards from Smith's Town River, and about one mile from Long Island Sound, into which that river empties, in the Township of Smith's Town, Suffolk County, Long Island, and opposite to my door. This post is a quarter section of a Locust trunk which must originally have been about eight inches in diameter. I have been informed by my uncle, Joshua Smith, father of the present Judge Smith, that this post was placed there by his father, Daniel Smith, grandson of the patentee of Smith's Town, *in the year* 1709. The soil in which the post stands is a black loam, and about sixteen feet above the surface of the river. It is about two feet in the ground. On examining it about a year since, below the surface of the ground, it was found perfectly and thoroughly sound in every respect. Above the ground there is no appearance of decay or rot, and no disfiguration whatever, except what has been caused by friction, or by its long exposure to the weather. And all the effect of these causes has been merely to roughen a little its surface. This post is alongside of a stone horse-block, and was intended and is now used as a support to ascend the block. Within a half-yard of this post there is also a flat red Cedar post, of about four inches thickness, and which belonged to a trunk which must have been about twelve inches in diameter. This post, which was set at the same time with the Locust post, is not quite so sound below the surface as that. Above ground it is also more decayed, and shows indications of having yielded more to the influence of the weather than the Locust post in the same part. The top, particularly, is crumbling.

RICHARD SMITH.

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340. To Mr. COBBETT.

SIR,—At the request of my friend, Doctor Peter S. Townsend, I have given the above Certificate with great pleasure, and hope it may answer the purposes you have in view from it, as I stand pledged to vouch for its accuracy,

With much respect,

I am, Sir,

Your most obedient and most humble Servant

RICHARD SMITH.

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341. The fact, then, of the durability of this wood, is here put beyond dispute. If it lasts sound as a post out of doors for more than a hundred years, it may be fairly said to last for ever. If it will make axletrees for a wagon, after having lain as a barn sill in the wet and dirt for forty years, it may be fairly said that it will yield to nothing but fire. This tree has *no sap*. It is all of the same quality, and Judge Lawrence showed me some with the bark on perfectly sound, after having stood more than twenty years. It is all spine. It is just as hard when as big round as your wrist, as when it is as big round as your body. Here are *hop-poles*, then! Here is stuff to make hurdle *gates* for sheep-folding! Here is stuff for clothes-posts and all sorts of uses. A Locust hop-pole, when once pointed, would serve, and that, too, without any more pointing, *for half a century*. At Fleet-street there is one of the stakes which I mentioned above, and which I brought from the farm of Judge Mitchell. Whoever looks at this stake will see that it was a mere branch, and a crooked and poor branch, too, cut off from a tree; yet it lasted as a stake for *thirty years*, and is now as hard and as solid as it was on the day that it was cut off the tree.

342. Will any one suppose, that the names that I have made use of here, are not real names? Amongst the wretched calumniators of the day, there may be some to *pretend* to believe this; but no one will believe it. I wish, however, to leave no doubt with regard to a matter, which, as the reader will clearly see, I have long had my heart set upon. I will therefore state, that Mr. Singleton Mitchell is a brother of the really celebrated Doctor Mitchell, of New York, who has written so ably on natural history, who is famed for his learning, who is a member of most of the learned Societies of Europe, and who is not less renowned

for his learning than he is for his goodness. The LAWRENCES are, EFFINGHAM, the uncle, and HENRY, the father, of Messrs. LAWRENCE, merchants at New York, who trade with London and Liverpool. Doctor TOWNSEND is the brother of Mrs. EFFINGHAM LAWRENCE. He was in London last June 1822, and must, doubtless, be known to many of the faculty in London. In short, these are all persons of the first respectability in every sense of that word.

343. Before I dismiss this part of the subject, namely, the great durability of the wood, it is bare justice to myself to insert two extracts from other English works: the first is part of a NOTE, by HUNTER, in his edition of EVELYN'S SYLVA; the second is an extract from the GENTLEMAN'S MAGAZINE of the year 1791. I beg the reader's attention to these extracts.

344. NOTE FROM HUNTER'S EDITION OF EVELYN'S SYLVA.

My excellent friend, Joseph Harrison, Esq., of Bawtry, has favoured me with the following observations, in a letter dated July 25, 1782:—"The first "experiment that I know of, respecting the application of the timber of the "Locust-tree to any purposes in ship-building, was in Virginia, where I "resided some time about the year 1733; and there, happening to be ac- "quainted with an ingenious shipwright, that had been sent over by some "merchants of Liverpool to build two large ships, I had frequent conversa- "tions with him, respecting the qualities of the several principal timber trees "in that country. Being a person of observation, he had made many useful "remarks on that subject; which the nature of his employment afforded "many opportunities of doing with advantage. He reckoned the Oaks, Elms, "Ashes, and many other timber-trees common to both countries, much in- "ferior to the same sorts in England; but frequently spoke of the Locust- "tree, as of extraordinary qualities both for strength and duration; and used "often to say, if a sufficient quantity could be had, it would be the best tim- "ber he had ever met with for the building of ships. After he had completed "his engagements with his employers at Liverpool, he set a small vessel on "the stocks for himself; but unluckily, not having a sufficient quantity of

" iron for that purpose, and none being to be had at that time in the country,
" he was obliged to put a stop to the work, till he bethought himself of the
" following succedaneum:—He had formerly (as hinted above) observed the
" extraordinary strength and firmness of the Locust-tree, and on this occa-
" sion took it into his head that tree-nails of that timber might be substi-
" tuted for iron bolts, in many places where least liable to wrench or twist,
" as in fastening the floor-timbers to the keel, and the knees to the end of the
" beams, which two articles take up a large proportion of the iron used in a
" ship; purposing, when he arrived in England, to bore out the Locust tree-
" nails, and drive iron bolts in their stead. When he first informed me of
" this scheme, I must own I thought the experiment very hazardous. How-
" ever, as necessity has no law, he put it in practice. The ship was built in
" that manner, loaded, and sailed for Liverpool, where she arrived safe; and,
" though they met with some blowing weather on the passage, she never
" made so much water but that one pump could easily keep her free. She
" returned back to Virginia the next year, when I had an opportunity of being
" informed, by the builder himself (who was then Captain of her), of what
" had been the result of his project. He said, that during the passage, espe-
" cially in blowing weather, he was very attentive in examining the water-
" ways, as, at that place, weak ships are most liable to work and strain; but
" that he could not perceive anything more than is usual in other vessels.
" When unloaded, she was hauled ashore upon the bank, in order to be
" searched both outside and inside; when, on the strictest examination, it
" was found the Locust tree-nails, that had been substituted instead of iron
" bolts, seemed (to all appearance) to have effectually answered the purpose
" intended; however, it was thought prudent to take several of them out, and
" put in iron bolts in their room: and this operation afforded another proof
" of their extraordinary strength and firmness; as they endured to be hacked
" out with a set-bolt, just as well as though they had been iron: whereas
" Oak tree-nails are usually bored out with an augur. The next voyage the
" ship made was to the West Indies, where the Captain died, and with him
" ended (for the present) any further prosecution of this matter: for, though
" the success of the above experiment was known to many, yet (as is fre-
" quently the case with new discoveries) none, that I ever heard of, made
" any use of Locust tree-nails in ship-building till many years after; though
" on the goodness of that article greatly depends the strength and durableness
" of a ship. I frequently recommended it, when opportunities offered, but
" all to no purpose, till about twenty years ago, when I was settled in trade
" at Rhode Island, I persuaded some ship-builders to try the experiment; but
" notwithstanding all my endeavours, the use of Locust tree-nails still conti-
" nued to be little practised or known, till it happened to be adopted by a
" builder of some eminence at New York, and of late years has been intro-
" duced into general use there, and in some parts of New England; but, as

" yet, the use of the Locust-tree in ship-building is confined to the article of " tree-nails, on account of its scarcity; for, was it near as plentiful as Oak, it " would be applied to more purposes, such as knees, floor-timbers, foot-hooks, " &c., being much superior to it, both as to strength and duration; and, " from its spreading into branches, affords full as large a proportion of " crooks, or compass-timber, as the Oak."

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345. EXTRACT FROM THE GENTLEMAN'S MAGAZINE.

The following Article appears in the Gentleman's Magazine for "Aug. 1791," Vol. 61. Part 2. page 699. It is signed Eben. Jessup. He is described by a Correspondent as an American gentleman, and an undone Loyalist, having lost a large fortune in the American war.

" IT is proposed that an Act of Parliament be obtained, apportioning about " 10,000 acres, or such a quantity of the lands in the New Forest and the " Forest of Dean, as may be judged sufficient for the purposes of Government, " to be set apart for growing *Locust-trees*, Live Oak, and White Oak, for the " use of the Royal Navy of this country. The Locust is a wood of a remarkably " quick growth; so much so, that twenty-five or thirty years will produce a " large tree, fit for the uses commonly made of it. Its strength is equal to " that of the Oak, and it is of so durable a nature, that a stake driven into the " ground has been known to stand exposed to the weather for the space of " eighty or one hundred years, before it began to decay. This wood is found " by the American shipwrights to be singularly useful in making the upper " works of large ships, and such particular parts of vessels as are likely to " decay soon. The Live Oak and White Oak are made use of for the same " purposes as the Locust-tree; and although they are of a less durable nature " than the Locust, they are still more durable than the *common Oak of this " country*. The Locust is used for making of tree-nails or pins for ships; " and twelve or fifteen years will produce a tree large enough for that parti- " cular purpose. The Locust-tree grows well in this country; and my Lord " Amherst, to whom I had the honour of suggesting my plans upon this " subject, informed me that he has Locust-trees now growing in his gardens. " It is also beyond a doubt, that the Live Oak will grow well in this country. " The Locust-tree grows best in poor land, a dry, sandy, or gravelly soil, " and such as will produce scarcely anything else — of such quality (as " well as of good land) there is a sufficient quantity already surveyed in " the New Forest."

351. I, like all other planters, was in *haste*. The nakedness of my house called for shelter. I bought *large trees*, carried them to Botley at great expense, planted them; but, by degrees, I pulled them all up, and flung them away, except a row of them, placed against a dead wall, merely as a screen. The plantation is, all taken together, the most beautiful that I ever saw. It consists, in part, of my LOCUST TREES, planted in the three years before mentioned; and of these I am now going to give an account. This account will be read *hundreds of years hence*. The time will come (and it will not be very distant) when the *Locust-tree will be more common in England than the Oak;* when a man would be thought mad, if he used anything but *Locust* in the making of *sills, posts, gates, joists, feet for rick-stands, stocks and axletrees for wheels, hop-poles, pales,* or for anything where there is *liability to rot*. This time will not be distant, seeing that the Locust grows so fast. The next race of children but one; that is to say, those who will be born *sixty* years hence, will think that Locust-trees have *always been* the most numerous trees in England; and some curious writer of a century or two hence, will tell his readers that, *wonderful* as it may seem, "the Locust was hardly "known in England until about the year 1823, when the "nation was introduced to a knowledge of it by WILLIAM "COBBETT." What he will say of me besides, I do not know; but I know that he will say this of me. I enter upon this account, therefore, knowing that I am writing for centuries and centuries to come.

352. In 1806, I imported several kinds of forest-seeds from the North American States, in which I had resided from 1792 to 1800. Of *Locusts* I sowed but little seed. It was sown in the spring of 1806, and TWO of the plants were planted out in April, 1807

353. In 1808, I got some more seed; and, in 1809, I planted FIVE of the plants. These, also, were planted in *April*, and very late in April.

354. In 1812, I sowed some more seed; and, in 1813 (in *April* again), I planted out FIVE of the plants.

355. These plants always made *part of a plantation*, consisting of several sorts of trees. I have not been to measure these trees myself; but they have been very carefully measured under the direction of a gentleman, who lives in that village, and who has been so good as to send me a statement of the dimensions. The *trees* (for they are really *timber-trees*) were measured thus: FIRST, the *height* to the tip-top; SECOND, the number of *inches round*, at the *bottom*, then at *three feet high*, then at *six feet high*, then at *nine feet high* and then at *twelve feet high*. If there were more than one limb, both, or all the limbs, were to be measured as high up as twelve feet. Now, then, for the dimensions. I will speak of the *soil* afterwards.

356. *The two trees planted in April* 1807, *raised from seed sowed in* 1806. *These trees have had seventeen years' growth.*

No. I.

HEIGHT, 42 feet.

INCHES ROUND, 68, at bottom.
58, at 3 feet up.
40, at 6 feet.
32, at 9 feet, limb 1.
22, at 9 feet, limb 2.
25, at 12 feet, limb 1.
18, at 12 feet, limb 2.

No. II.

Height, 38 feet.
Inches Round, 60, at bottom.
34, at 3 feet, limb 1.
34, at 3 feet, limb 2.
31, at 6 feet, limb 1.
33, at 6 feet, limb 2.
22, at 9 feet, limb 1.
22, at 9 feet, limb 2.
22, at 9 feet, limb 3.
17, at 12 feet, limb 1.
18, at 12 feet, limb 2.
18, at 12 feet, limb 3.

The five trees planted in April 1809, *raised from seed sowed in* 1808. *Fourteen years' growth.*

No. III.

Height, 38 feet.
Inches Round, 28, at bottom.
24, at 3 feet up.
23, at 6 feet.
23, at 9 feet.
19, at 12 feet.

No. IV.

Height, 35 feet.
Inches Round, 28, at bottom.
22, at 3 feet up.
21, at 6 feet.
18, at 9 feet.
17, at 12 feet.

No. V.

Height, 39 feet.
Inches Round, 26, at bottom.
23, at 3 feet up.
20, at 6 feet.
14, at 9 feet, limb 1.
13, at 9 feet, limb 2.
13, at 12 feet, limb 1.
12, at 12 feet, limb 2.

No. VI.

Height, 36 feet.
Inches Round, 24, at bottom.
22, at 3 feet up.
20, at 6 feet.
15, at 9 feet.
13, at 12 feet.

No. VII.

Height, 35 feet.
Inches Round, 22, at bottom.
20, at 3 feet up.
16, at 6 feet.
14, at 9 feet.
12, at 12 feet.

The five trees planted in April 1813, *raised from seed sowed in* 1812. *Eleven years' growth.*

No. VIII.

Height, 39 feet.
Inches Round, 32, at bottom.
25, at 3 feet up.
24, at 6 feet.
19, at 9 feet.
16, at 12 feet.

No. IX.

Height, 38 feet.
Inches Round, 33, at bottom.
24, at 3 feet up.
23, at 6 feet.
19, at 9 feet.
16, at 12 feet.

No. X.

Height, 37 feet.
Inches Round, 38, at bottom.
30, at 3 feet up.
25, at 6 feet.
24, at 9 feet.
18, at 12 feet, limb 1.
19, at 12 feet, limb 2.

No. XI.

Height, 40 feet.
Inches Round, 36, at bottom.
30, at 3 feet up.
26, at 6 feet.
24, at 9 feet.
19, at 12 feet.

No. XII.

Height, 40 feet.
Inches Round, 38, at bottom.
31, at 3 feet up.
28, at 6 feet.
26, at 9 feet.
22, at 12 feet, limb 1.
16, at 12 feet, limb 2.

357. Now, let it be observed, that these trees are growing at Botley; that anybody may see them there; that there are thousands of persons who can bear testimony to the rise of the plantation; that the men who planted these trees are living, and on the spot too.

358. Did any one of my readers ever know, or hear of, a growth of timber-trees to equal this? *Larches* and *Firs*, even these soft things, were, perhaps, never known to get up and to swell out as fast as this. I reckon the years of growth from the year of *planting out* to *this year*, inclusive, though there is almost half a year less. The last tree, for instance (No. 12), has not been planted out *eleven years* until next April. And did Englishmen ever before hear of such growth of timber *far better than Oak?* Look at the dimensions of that tree. *Forty feet* high, *three feet and two inches* round at the bottom, and its two limbs, at *twelve feet* from the ground, *just the same* bigness. I regret that I did not get the *inches round* at twenty feet from the ground. But, only think of such a growth of wood ten times as good as Spine Oak!

359. But, now, as to the *soil*. No soil can be too good for such trees. But, the Locust will grow on almost any soil. The reader will have perceived a great difference in the *rate* of growth of the three plantations; and I am now about to show the cause of it. The *first* plantation (Nos. 1 and 2) was made in *deep, rich, fine mould*. The *third* plantation (Nos. 8 to 12) was made in *good loam*, and by *the side of running water*. But the *second* plantation (Nos. 3 to 7) was made in a *poor gravelly* soil, having about a foot of earth, pretty well mixed with stones at the top, and then, as you went down, more and more of gravel. In short, very poor land indeed: a *gravelly brow*, with, at about four

feet deep, a bed of sour clay under the gravel. This ground was, however, *well trenched,* in the manner recommended in this work: the gravel was kept at bottom, though the ground was all *well moved* to the depth of two or three feet. But, who can reasonably wish trees to grow faster than those of this second plantation. At the utmost, it is but *fourteen years old,* and the average height is *thirty-six feet seven inches;* the average bigness round at bottom is, *two feet four inches;* and, at twelve feet high, the average bigness round is one foot five inches; and the average *diameter* is more than seven inches. Where do you find such a growth as this, even of *Firs?* One of *these* trees is sufficient for a common *gate-post;* sufficient to cut *sills* of *doors* and *windows* out of. And always, straight or crooked, fit for *ship-trunnels,* which are not above eighteen inches long, and only about two inches through. You may plant today, and have wood for ship-trunnels in five or six years' time.

360. I beg the reader to look at the *shape* of the above trees. The two first were wanted to *spread,* and were, therefore, pruned to have limbs come out not far from the ground. The heads of these are about *twenty feet across.* The others, from Nos. 3 to 12, were planted in *close* order, not at more than *four feet apart.* They were kept pruned to a single stem, until Sidmouth and Company drove me off early in 1817. That year, and 1818, they went unpruned; but I pruned them again at Christmas 1819, though some of them had then got limbs too big to cut off. My intention was, that they should have *clear stems forty feet long.* The prunings of these few trees produced a good large parcel of *fire-wood;* and here is another important matter; for the Locust wood, green or dry, is the very best for fuel. It is, at least, nearly equal to the *Hickory.* A log of

either, when once fairly on fire, will never go out. If it be on fire at one end, and you leave it to itself in that state, the fire will keep eating on till it has consumed the whole log. What a difference, even in this respect, between this wood and any wood that we have of common growth in England!

361. This tree grows even *better* in England than in the United States of America, generally. Along the coast, in Pennsylvania, it will not thrive. It grows pretty well in some parts of Long Island; but not nearly so fast and so *clear* as in England. They *plant* it in their fields, though they have so much of natural woods. They never neglect to cherish the Locust tree, though they slaughter every thing else. It does not grow so fast as in England. It is VERY DEAR, *compared with other timber.* A good large tree will fetch from *ten* to *twenty pounds;* and, while this is the price of Locust, they cut up the most beautiful *Oak*-trees for *fire-wood!*

362. We have this famous tree, and have had it for about a hundred years, growing in our *ornamental plantations.* I saw a tree or two that had been cut down in the gardens of LORD RANELAGH, at Fulham, in 1819, just after my return from America. These trees were sold to a carpenter, and I bought one of them. I have applied the timber to several uses, such as *dog-houses,* a *wood-cutting horse, sills for a smoke-house.* I have had a *window-sill,* made of this Fulham Locust, on purpose to *show* at the *Office of the Register,* where any gentleman may now see it. It is about seven inches through. I have also had *some little blocks* of this wood cut out, and they are at the Office of the Register for any one to look at, and, if *good reason* be given for it, to

be *taken away*. Some gentlemen may wish to send a block to friends who are not in London. If the booksellers who sell the Register in the country, should be applied to for the purpose, by gentlemen in their neighbourhood, *a block of the wood may be sent to them*. There is nothing like *seeing* in cases like this.

363. Now let us see what are the inducements to the growing of the Locust. Its use, at the earliest stage, would, perhaps, be *hop-poles*. The ordinary height of a hop-pole is about fifteen or sixteen feet. To obtain poles of sixteen feet would require, in land worth a pound an acre, annual rent, *six years'* growth, and no more. You see, that, in my waterside plantation, there is an average height of thirty-nine feet. This is in *eleven years*. And, in the gravel-brow plantation the average height, at fourteen years' end, is thirty-six feet seven inches. You must *cut off four feet*, perhaps, to come down to wood big enough for the top of a hop-pole. This leaves thirty-two feet seven inches; and that is sixteen feet three and a half inches for each of the seven years. But, it is well known, that, as to *height*, a tree goes much farther in the first four or five years, than it does in the same number of years afterwards. The fact, as to these trees is, that they were fit for hop-poles at *five years* from the day of planting out.

364. *Four feet* each way is the distance for planting; and, then, an acre contains *two thousand seven hundred and twenty*. Let us see the cost. The items are: the rent of the land for six years; the taxes and rates; the *trenching* of the land, for, without this, half your time is lost; the plants; the planting; the hoeing for three years. You must hoe twice, once early in June, and once early in

August (in *dry weather*), for the three first years; to keep out grass and weeds. After that, nothing will grow under the shade, so complete will it be.

365. We are going upon the supposition that the planter *rents the land*. A very disadvantageous supposition; but, let us take it; supposing him to have a lease of twenty-one years. He cleans his ground well; and then, in the winter, this very winter, he has it trenched in the manner described in this work, *keeping the good soil at the top*, and especially if there be *gravel* or *clay* at the bottom: but, in short, trenching *in the manner there described*. I always planted in *April;* but, it is *late;* and I would advise the supposed planter to do it earlier. I suppose him to have plants of the middle size. In his twenty-one years, he will have *three* (at least) cuttings of poles; for, when he has cut his first crop, up springs another; and he will now, at this second cutting, get *two* or more *poles from each plant*. He will have more at the *third* cutting. How much is a sixteen feet hop-pole worth, that does not require shaving, and that will last *forty years?* An *Ash pole*, when shaved, will last *three years*, and, a part of it, *four years;* but, a bit must come off at the bottom of it in each of the two last years, which makes it but short; and, by this time, it is wholly unfit to stand against the wind, when loaded with the binds and leaves and hops. *One* Locust pole is, then, worth more than *ten Ash poles*, because there is *ten times* as much cost *in carriage*, and ten times, nay, *thirty times*, as much cost in pointing; besides the *falling off in length* in the Ash pole, during the two last years of its service. The carriage is, perhaps, upon an average, *one-third part* of the cost of the pole. Taking all these things into consideration, *one* Locust pole must be worth nearly *a score* of Ash poles of the same size and length. What is

an Ash pole worth? I should suppose, that, take Kent, Surrey, Sussex, Worcester, Essex, and all the hop-plantations upon an average, a fair *Ash pole* of sixteen feet cannot be worth less than *threepence*, besides carriage. At this rate, and taking all the differences of the two into view, a Locust pole is worth nearly *a crown*. But, suppose it to be only *ten times* as good as the Ash; nay, suppose it to be only *four times* as good, it is then worth *a shilling*: and, indeed, it is worth a great deal more. How, then, stands the account of the acre of land for the twenty-one years?

At the end of the first Six Years.

Cr.	£.	s.	d.	£.	s.	d.
2720 Poles, at 1s.				136	0	
Dr.						
Six years' rent	6	0	0			
Taxes and rates	4	0	0			
Trenching, at 9d. a rod	6	0	0			
Plants, at 11s. a hundred	14	17	0			
Planting	0	15	0			
Six hoeings in three years	2	8	0			
Interest of money advanced	8	10	0			
				42	10	0
Profit				£93	10	0

At the end of the second Six Years.

Cr.	£.	s.	d.	£.	s.	d.
5440 Poles, at 1s.				272	0	0
Dr.						
Six years' rent	6	0	0			
Taxes and rates	4	0	0			
Interest on advances	2	10	0			
				12	10	0
Profit				£260	10	0

At the end of the third Six Years.

Cr.	£.	s.	d.
5440 Poles, at 1s.	272	0	0

Dr.	£.	s.	d.	£.	s.	d.
Six years' rent	6	0	0			
Taxes and rates	4	0	0			
Interest on advances	2	10	0			
				12	10	0
Profit				£260	10	0
First six years				93	10	0
Second				260	10	0
				£614	10	0

366. This is the result at the end of eighteen years. Then the tenant may *grub up*, or sell the stems and the three years' growth to the landlord. This is all plain, and all true; but, it would, doubtless, be prevented by *the increase of Locust plantations*. However, this conclusion is undeniable. A product like this may be relied upon, as safely as may a crop of wheat of four quarters to the acre, in wheat land which is in good order for the wheat.

367. If the plantation were for *timber* trees, the distances ought still to be the same, and the whole of the trees might stand till each was seven or eight inches through at six feet from the ground. Then a part might be cut down. Probably it would be a good way to leave the trees then, at eight feet apart, this would give two thousand and forty trees to cut down; and would leave six hundred and eighty trees to grow on. The two thousand and forty trees cut down, are each of them fit to make a common gate post; or, perhaps, to make from four to six window sills; or a couple or more of door sills, or a couple of park-pale posts. These trees could not be worth less than five shil-

lings a-piece. The above trees from number three to number seven, fourteen years old, cannot, at this moment, be worth less than five shillings a-piece. Each of them must have, at least, three feet of timber; and what timber is there that anybody can buy for twenty-pence a foot? The worth then, of this weeding of the plantation would be, five hundred and fifteen pounds per acre at the end of fourteen years. The six hundred and eighty trees remaining would be worth a great deal more than a pound a-piece, at the end of another seven years. Thus an acre of land, besides paying rent and taxes, would yield a profit of more than a thousand pounds in twenty years.

368. When I made my little plantations of 1809, I planted, *in a field*, about six acres, partly of Locusts, partly of Ash, and other trees. In consequence of ELLENBOROUGH, GROSE, LE BLANC, and BAYLEY sending me to prison in 1810, this plantation got smothered with weeds, and a bailiff ploughed it up in 1811. A little piece of this plantation was left, it happened to be of *Ash*. The plants stood at the rate of four thousand eight hundred and forty upon an acre. The trees upon the piece which was not ploughed up, are now worth, I should think, a couple of shillings each; and that is at the rate of four hundred and eighty-four pounds an acre. So that there is nothing so very wonderful in the calculation relative to the Locusts, the profits of which, I have, indeed, greatly under-stated.

369. In the year 1810, the Spring of that year, I sowed as many Locust seeds as I thought would produce plants sufficient for an hundred acres of land; that is to say, two hundred and seventy-two thousand. I intended to plant these hundred acres in six distinct parcels of land, I having then six children; and I intended that each child should

have one parcel, and that my sons should all be farmers. I saw the seeds come up in the Spring, most beautifully, and the scheme seemed to be in a fair way of accomplishment. But, alas! Ellenborough, Grose, Le Blanc, and Bayley laid hold of me, in the following month of July! Away went the Locust trees; and I became pitted, life for life, against the THING, under the existence of which, I had been condemned to live with felons for two years of my life; to pay a fine of a thousand pounds to the King; and to be held in bonds for seven years after that; and all this because I had expressed my indignation at the *flogging of Englishmen, in the heart of England, under a guard of German bayonets.* The poor little Locust trees were buried amongst weeds and speedily destroyed; but I took care of the sons, who, however, have been prevented from becoming *farmers.*

370. My plan had nothing in it that was not most rational; and if I had now a hundred acres of land, or even fifty acres, I would not part with a single Locust plant, except to oblige a friend. It will not be long, I dare say, before I shall make another sowing, with much about such a design as I had before; and Ellenborough, Grose, and Le Blanc will not disturb my project, at any rate; for which God be praised! When the plantation of the trees from number three to number seven was going on, one of the men observed that the trees were very small. I said, small as they are, we shall see them grow into great timber trees. One of the men, whose name was Gurman, said: "Our grand-children may, Sir, but we never shall."—"I beg you will speak for yourself," said I; "for I expect to live to see them as *big round as my body.*" There is hardly a tree of them that is not that already. And, indeed, it is a sorrowful instance of human frailty, that men are deterred from planting because they

think that they, themselves, shall not see the trees come to perfection.

371. In the above accounts of expenses, I have omitted the expense of pruning, or, at least, of felling and trimming the poles and trees. These expenses will fall greatly short of the amount of the *fire-wood*. The lop, however, will not be very great, seeing that the trees are to be constantly pruned, whether for poles or for timber. My trees of the two last plantations would have run out into limbs, like the two trees of the first plantation, if I had not been careful about the pruning. You must, also, be careful to prune *in time;* and sometimes to give, not only a winter pruning, but a summer pruning also. This, however, is a very trifling matter; for a clever man, with a good knife, will go over an acre in a day, and pick up his cuttings into the bargain; though, perhaps, the summer cuttings are hardly worth picking up.

372. I have only one thing more to observe as to the cultivation; and that is, that I advise to cut down the trees, early in the month of May, the year after having planted them out in April. Early in May they begin to show their leaves, and then I cut them down within an inch of the ground, taking care to have a very sharp knife, and to hold the stem of the plant firm, so as to prevent the root from being loosened by the operation. If the plant be of a tolerable size when planted; if the ground be well prepared, and the planting well performed, the tree will send up a shoot of full four feet the first year. You must have your trees looked over in about a fortnight after cutting them down, and again, in about a month, to see whether there be more than one shoot coming out from each stem. If there be, you must *rub off all but the strongest*. If this should be neglected,

which it ought not, by any means, you must take care, when winter comes, to have but one shoot to each stem.

373. "It is a pity to cut it down!" How often have I heard this exclamation from persons, and persons of great sense, too, when I have advised them to cut their young trees down. Even gardeners and nurserymen are, in many cases, with difficulty prevailed upon to refrain from acting upon the notion of this exclamation; which means, in fact, that it is a pity to have straight and fast-growing trees. A neighbour of mine, the late Mr. CLEWER, of Botley, told me, that he sowed, when he was a young man, three acorns, in a row near to each other. I forget the number of years that he suffered the plants to remain when he cut two of them down close to the ground, leaving one of them untouched. At the end of two years afterwards, he cut down again one of the two which he had cut down before, leaving the other two untouched. At the end of twenty years, the result was, what I cannot precisely recollect; but, as far as I can recollect, the tree which had been cut down twice, was a great deal taller and bigger than the tree which had been cut down only once; and that even this was half as tall again, and more than twice as big round at the bottom, as the tree which had not been cut down at all. If this be the case, with regard to trees that have never been transplanted, how necessary must it be to cut down transplanted trees!

374. Great part of the foregoing paragraphs, relative to the Locust, were written and published in 1823. In 1825, I wished to produce proof of the quickness of growth, from the plantations or plantation of some other persons or person. An instance of the superiority of the Locust over other trees in point of quickness of growth, I had seen in

a plantation of Mr. GUNTER, at Earl's Court, less than a mile from the village of Kensington. I therefore had the trees measured, one by one; and published a list of the trees; but afterwards I took the average of them, in order to save room. There were several trees of each of the sorts; about fourteen LOCUSTS, twelve SCOTCH FIR, eight SYCAMORE, ten SPANISH CHESNUT, ten BEECH, eleven ASH, and thirteen OAK. I added the dimensions together of the trees of each sort separately; and then found the average measurement, by a division by the numbers that there were of each tree; the result being as follows:

375. I have now taken the plantation of Mr. GUNTER, at EARL'S COURT, not *a mile from Kensington*. This plantation was made FIFTEEN YEARS AGO. It consists of *Locusts, Scotch Firs, Sycamores, Limes, Spanish Chesnuts, Beeches, Ashes, and Oaks.* I have, by permission of Mr. GUNTER, had the trees of this plantation *measured* with great exactness. The whole of the trees were planted at *one time*. The soil is everywhere the same. The trees *were mixed* in the plantation; and, therefore, this is as fair a trial, *as complete a proof*, as can possibly exist. Each tree was measured to ascertain the INCHES *round at the bottom*, then round *six feet up*, then round *twelve feet up*, then round the *biggest limb*, and then the *height* of the tree in FEET, was taken. To save room, I shall only give the *average* dimensions of each *sort* of tree; so that here we have an account, from which a comparison can be made in a moment. The reader will be surprised to see the *vast superiority* of the growth of the Locust, over even the *softest* and *most fast-growing* of our English trees; but *there are the trees to be seen* by any gentleman that will apply to Mr. GUNTER'S bailiff, who, I believe, planted the trees. And, as to the *soil*, it is likely to be *good;* but it is the same for

all the sorts. Look, then, at this table. See the vast difference. See *one limb* of every Locust nearly as big round as the *bottom of the trunk* of every Oak. See the Locusts, at *twelve feet up*, as big round as the Ash, *at the ground.* See the Locust, in *all the different girts*, a great deal MORE THAN DOUBLE the average of all the other trees taken together; and, finally, see the Locust *twenty-seven* feet high, while the average of all the other trees is less than *eighteen* feet.

SORT OF TREE.	Inches round at bottom.	Inches round 6 feet up.	Inches round 12 feet up.	Inches round a limb.	Feet in height of the tree.
Locust	31	25	12	7	27
Scotch Fir	16	10	5	2	17
Sycamore.....	15	10	5	3	22
Lime.....	17	8	5	2	18
Spanish Chesnut....	19	14	12	2	19
Beech	12	9	5	—	19
Ash	12	10	5	1	17
Oak	11	7	4	—	12

376. This point is, then, settled; and it is here proved, that it is an error to suppose, that *quick-growing* trees are, for *that reason*, trees of *soft* and *perishable timber.* It is certain, that the American *Red Cedar*, and the *Live Oak*, which are everlasting timber, are very *slow* growers; and *our Oak* is also a slow grower, as will be seen above. Our *Yew* is the same, and it is everlasting. But our *Elder*, which is, when young, *the very fastest grower that we have*, is, though it gets to but little size, as durable as the *Yew* or the *Locust.*

377. The Locust is not a tree to thrive to a very *old age.* It is in its prime in about thirty or forty years. There are many in Kew Gardens *three feet through;* and *I bought*, a

few years ago, two very large butts, cut down in the garden at the *Stable Yard*, St. James's Park. These were, I should think, full three feet through; and there is a Locust-tree, in the garden of a school, formerly kept by a Miss Tasker, at Brook-Green, Hammersmith, *with a trunk ten feet round*, and guessed to be *fifty-four feet high*. But, one great excellence of this tree is, it is fit for use *at any age* above four or five years. At this first age, it will do for *stakes*. It has *no sappy part*. Mr. GUNTER's trees would now make as good *Locust-pins as any older tree*. So that as to what age the tree will *continue to thrive*, is of no consequence at all. If Mr. GUNTER's trees were *now* to be cut down, the *fourteen* Locusts would be worth *ten times* as much as all the rest of the plantation, though they make about *a hundred and sixty in number*. What, then! will *the Government* send to America for Locust-pins, while they may have them grown in WOOLMER FOREST, in about ten or fifteen years? Will they not plant these trees? It will be done, at last, in spite of the pretty gentlemen, if not with their good will. They must, however, take care what *seed* they get. There are several sorts of Locusts, that I know of, and they are all called *Locusts* in America. As to getting the seed from *France*, where, as well as in England, the sorts have been planted *promiscuously*, and without knowing any thing of the qualities of the wood, such seed never can be relied on. I do not know the seed of some of the sorts, one from the other; but I know the *plants* the moment they appear above ground. But, if *I* have a channel that I can *rely on* for the obtaining of this seed, surely those may, who have hundreds of thousands to expend in naval victories on the Serpentine River, and on enterprises equally useful and equally glorious.

378. I was just about to close, or rather to cease to

speak of the quickness of the growth of the Locust, when it occurred to me, that it might not be amiss to obtain an account of the progress of the plantations of LORD FOLKESTONE, now EARL RADNOR, mentioned by me in the Register during my "Rural Ride" in the fall of 1826. The History of these plantations is the most interesting, that can possibly be, to all those who are engaged in planting or who intend to plant. In 1822, very late in the month of May, I sowed some Locust in my garden at Kensington, Not being prepared for the sale of them in 1823, and not having room to transplant them at Kensington, I got a friend in Sussex, to let me transplant them in a part of one of his fields. They were taken in a wagon, tied up in bundles just like so many fagots, and carried to the distance of thirty miles. They were transplanted in rows at eighteen inches apart, the plants at about eight inches apart in the rows. They were thus put into the ground in very *hot weather*, between the 6th and the 8th MAY, both days inclusive. The next year, 1824, I began selling trees; and I engaged, that LORD FOLKESTONE should have the whole of those, which had been put into the field in Sussex. His Lordship intended to plant, and did plant them, on his estate at COLESHILL, a village in Berkshire, lying on the road from the town of Farringdon, to the town of Highworth, being rather nearer to the latter than the former. They were taken up in the field in Sussex on the 13th March (1824), the morning of the day being fine, but there being a heavy *fall* of *snow* in the afternoon. The next day, it snowed again, and it being Sunday, the trees remained lying on the ground in bundles, until Monday the 15th when the wagon arrived to take them to COLESHILL. The bundles made a very great load for the wagon, rising about six feet above the raves or tops of the sides of the wagon. They were not packed up with straw or

mats; but a little fern was laid on the insides of the wagon, and over the top of the load, a single mat was put over the whole, and then the load was bound on with a rope like a load of straw. The trees were, I think, three days upon the road, and, of course, could not be planted out before the latter end of March.

379. There appeared to me to be about forty or fifty acres in the whole of his Lordship's plantation, covering the side of a hill of gentle declivity, in a part of his park. The plantation consisted of all sorts of forest trees; but, the Locusts were *not mixed* with the other trees, and were placed in clumps of one hundred, two hundred, three hundred, or more. When I saw them in the fall of 1826, they appeared to be, upon an average, of more than twelve feet high; and, at a distance, they looked like clumps of trees which had been planted many years previous to the planting of the trees of the rest of the plantation.

380. I was desirous, upon the present occasion, to be able to state very accurately, what were the size and height of them NOW at the end of *four years of growth.* With this view, I wrote to Mr. DANIEL PALMER, who is LORD RADNOR'S bailiff at Coleshill, and who had planted the trees, to measure all the trees, one by one, contained in one of the above mentioned clumps. He took a clump which had ninety-two trees in it. He numbered the trees from one to ninety-two, and sent me on the 6th of this present month of March, the measurement of each individual tree in the following manner: 1. *The bigness in inches round just above the ground:* 2. *The bigness round the trunk at six feet above the ground:* 3. *The height of each tree, from the ground to the top of the topmost twig.* I have added these dimensions together, dividing, in each case, by *ninety-two;* and the ave-

rage, casting away in each a trifling fraction, is as follows: Bigness just above the ground, *eight inches and a half round:* bigness of the trunk six feet from the ground, *six inches and a half:* height, *sixteen* FEET. Mr. PALMER tells me, that this clump is inferior to some of the others. He mentions one containing four hundred Locusts, the average size just above the ground, *ten inches and a half;* six feet from the ground, seven inches, and the height twenty-two feet. He mentions a third clump containing two hundred Locusts, nearly the same in bigness round as those in the last-mentioned clump, and in height *nineteen feet.* The reader will please to observe, that these trees were planted in the month of March 1824, and that, therefore, they have now been just four years in the ground. He will also please to observe, that the trees of the two last-mentioned clumps must at this very moment be fit for hop-poles, and that they will last in that capacity for twenty or thirty years at the least. The trees in the two last-mentioned clumps would split, and be more than sufficiently big to make the end bars, of what are called *hurdle gates* for sheep and cattle, in which capacity they would last for a life-time or two, instead of lasting for four or five years, as is the case with OAK. These trees are, upon an average, now worth a shilling a-piece; but, suppose they take another year to bring them to this point: they stand upon exactly five acres of ground; reckon rent and taxes at two pounds an acre (for plantations are *tythe free*), that would amount to fifty pounds for the five years. Allow six pounds an acre for the trenching and cultivation; that brings the charge to seventy-three pounds. The trees would now cost, out of my nursery, and finer trees than those were, for each hundred ten shillings, or five pounds a thousand; or, for *thirteen thousand six hundred,* which was the number sent to COLESHILL, 68*l.*, making the

whole charge 134*l.* Thirteen thousand, six hundred trees, at a shilling a-piece, amount to *six hundred and eighty pounds;* and these trees will be worth that money next year, better than an Ash pole of twelve or fourteen years growth is worth six-pence. The profit then would be of these five acres of plantation 529*l.*; exceeding any of the calculations made by me in the former part of this article.

381. A plantation will be converted to different uses to accord with the different circumstances of the country in which it stands. There are no hop-grounds near to Coles-hill; but there are always various uses for wood that is three inches through or nine inches round. Most likely these trees will be thinned out for some of those uses. One half left, that half would become *posts* sufficient for moderately sized gates, or paling, or for sills to windows or doors; and then they are worth a *crown a-piece;* and whoever lives to see these trees at the end of ten years of growth, will see them worth that crown a-piece. So that a plantation of about a hundred acres would, at the end of twenty years, in tolerably good ground, be a fortune, not to turn up the nose at even by the son or daughter of a peer.

382. But, in countries where hop-poles are wanted, and where Ash poles sell on an average, I believe, at three pounds a hundred, what would be the value of a plantation like that of Lord Radnor? At the end of five years his trees would bring a shilling a-piece; being cut down, each stem would send up two or three. He would have three times the number of shillings at the end of another five years; for, they would become poles a great deal sooner the second time than the first. Mr. Withers, an eminent attorney near Holt in Norfolk, who has written very ably and very usefully on the subject of planting, and particu-

larly on the planting of LOCUSTS, has produced several shoots from his plantations of one year's growth from stems that have been cut down, and, amongst these shoots, there was one more than nine feet long, and *six inches* round at the bottom, coming from the stem of a young tree, which had been cut down, on account of its having been broken by the wind. Mr. DANIEL PALMER tells me, that there were eight trees in the clump, where he measured the ninety-two, which were short and unworthy of the rest; that he took these eight trees up *last year*, planted them in another place, and cut them down to the ground at once; and that they, though just removed, made shoots of *six feet long last summer*. It is, however, perfectly notorious, that the cutting down of trees causes them to shoot in this vigorous manner. It is impossible, that, when a Locust pole can be had for a shilling, anybody will ever give three pence for any other sort of pole; and, it is also impossible, that any man of sense should not perceive, that this is the most profitable tree that can possibly be planted. Mr. PALMER gives me an account of the size and height of the trees in the general in the mixed plantation where the LOCUST plants stand; and upon reducing these to an average, as nearly as I have been able, they appear to me to be *less than one-third part* of the size and height of the Locust; to say nothing at all about the inferior quality of the wood. Not one penny of profit can come out of that general plantation for twenty years yet to come. Three crops of Locust poles, or two crops of Locust posts, may be taken off the ground before you can put an axe or a hook into the rest of the plantation; and yet, even plantations like that are very desirable things.

383. I have now left no doubt in the mind of any reader as to the great durability, the various important uses, and

the quickness of growth, of this tree. It remains for me to speak in detail of the manner of propagating it, which is only from the seed, which it bears in great abundance, but which will seldom come to complete perfection in England. My seed has always come from the neighbourhood of Harrisbourgh in Pennsylvania, and each seed is nearly double the weight of any that I have ever seen gathered in this country. The seed is gathered in the fall of the year, and it keeps best in the pod; but, if made perfectly dry before it is put up, and always kept in a dry place, it will grow, though not so well perhaps, after being kept for several years. The seed is as nearly as possible in shape like a kidney bean, but not above a tenth part so big as the seed of the common white running bean; its colour is a very dark brown. If sown in the fall of the year, or early in the winter, a part of it will come up in the spring of the first year; but it will be only a small part; and, the plants which do come up, will, if there be sharp frosts, be very nearly destroyed. I sowed this seed repeatedly, and had very little success. I asked JUDGE MITCHELL in Long Island, who had a nursery of these plants even in that country, how he got them to come up: he answered in two words, "*boil them!*" "Boil them," exclaimed I. The conversation was turned off upon something else; but when I found such great difficulty in getting the seeds up at Kensington, I recollected the precept of MR. MITCHELL, and I resolved to put it in practice, which I did with complete success; not by absolutely boiling them, but by soaking them in boiling hot water.

384. There is, however, a good deal of nicety attending this matter, therefore I shall describe the process very minutely. When you have prepared the beds, in the manner described for the ASH, take in the morning as much seed

as you think you can conveniently sow before night; put it into a tub or some vessel, sufficient to hold the seed, with water five or six times as much in measure as the seed; then take water at full boil out of your copper or other boiling vessel, pour it upon the seed; give the seed a stir up amongst the water, cover over the top of the vessel close, and there let the seed remain for an hour or so. Then take off the cover of the vessel; and raise up some of the seed by a ladle, or some such thing, and look at your seed, some of which you will find swelled to nearly double their former size, and some of them hardly augmented at all in size. Another hour, or perhaps less (and you ought to look frequently at them), will have made all the seeds swell, except a small part perhaps, and those will not grow at all. Then pour the seed, water and all, into a fine sieve, which will let the water through and keep the seed back, have some dry sand ready with a hole made in the middle of the heap, to put your seeds into, and then mix up the whole heap of sand with the seeds, about three gallons of sand to one gallon of seed.

385. Your beds are already prepared, and now you scatter the seed over them along with the sand, in the manner described in the case of the ASH. Do not sow too thickly; if you do, many of the plants will be destroyed by the others, and will be very weak and not fit to plant out the first year at least. If sowed thinly, and if the ground be good, and the beds kept clean, your plants will be four feet high by the month of October, quite fit to go into plantations out of the seed bed. My plants are always sold from the seed bed, and a very large part of them are fit to go into plantations at once; but this cannot be the case, if the plants be sowed thickly.

386. I have never sowed LOCUSTS till the month of April,

or very late in March; because, by soaking they are made to come up in the space of a fortnight, and they should not come up, till the sharp frosts be all gone. But, when seeds have been soaked in this manner there is great care required, to keep them from the sun and the wind: they should therefore be covered as quickly as possible after they have been scattered on the bed, and the earth that goes on them should be made very fine. The covering must not be more than an inch deep, and must be laid on very evenly, and with the greatest possible care, so that no openings may be left, for the sun or wind to find access through. If the weather be dry, as it ought to be for the work of sowing, water the beds gently, with a fine-rose watering-pot, the second day after sowing; but not by any means while the earth is fresh at top; for if earth be freshly moved when you water, it runs together, and binds over the top, where it forms a shell, which is difficult for the heads of the plants to penetrate. Last spring, I had several beds of various seeds which failed, but I wished to wait, as late as I possibly could, to give the seeds a chance to come up. In the *middle of June*, or thereabouts, seeing that the seeds would not come up in these beds, and not liking to let them remain all the summer without a crop, I determined, late as the season was, to sow them with Locusts, which I did in my usual manner; but, the weather being dry and hot, I not only watered the beds very well, the day after the seeds were sown, but kept them sheltered from the sun by mats, until the seeds began to come up. I never had so regular and so perfect beds of Locust-plants before. They were upon an average a foot and a half high in the month of October, and nine-tenths of them might have gone out into plantations at once.

387. Such very late sowing, is not, however, to be at-

tempted, unless you be resolved to take all the precautions which I took. If wet weather should happen to come the day after sowing, or even shady or moist weather, you need not resort to the covering with mats; but otherwise, the late sowing is not to be attempted without shading.

388. When a Locust tree is a foot and a half, or two feet high, it is quite fit to go into any plantation, even amongst other trees; for, if cut down in the month of April, the year after planting, or even in May, it will soon over-top other trees; but if the plants be really too small to put out at once, they should be assorted with care, the stout ones in one lot, and the weak ones in another; and thus, precisely after the manner of the Ash, put into the nursery, the roots having first been properly pruned.

389. I have, in former parts of this article, said enough about distances in the plantation; but I must here add, that, when old coppices of a mixture of underwoods, want *filling up*, there is nothing like the Locust. In such coppices, there are frequently vacant spots, of a rod or more square. The land in these spots produces nothing but grass and weeds. The grass can never be eaten off by cattle without destruction to the underwood; so that the fencing, the rent, and the taxes for these spots of land, are all thrown away. Those who take care of their underwoods, dig holes therefore in their vacant spots, and plant young trees to produce new stems. These, however, go on very slowly compared with the Locust. If the Locust were planted the year after they are sowed, in a hole made about six feet over, and three or four plants in each hole; and if they were cut down the year after planting, they would always overtake the old coppice, and produce hop-poles as quickly as these would be produced by the old stems of the Ash or

Chesnut, which mount faster, or at least become a pole sooner than any of the rest of our underwoods.

390. As underwood, the Locust would not only make poles, but stakes to last for a life-time. Michaux says, that when as big as one's wrist, or less, they are cut down, on the borders of the Garonne, in France, and are *cleft in two*, to make vine props or stakes, and that in that capacity they serve, slender as they are, for twenty years. Nine times out of ten, our dead hedges, whether made of bushes or of rods, tumble down at the end of two years, owing principally to the perishable quality of the stakes, which rot from the top of the ground downwards, in a very short time. A hedge made with Locust stakes would stand till the rods and the bushes were absolutely rotten; and these being not exposed to the working of the wet and the ground upon them, would last much longer than they now do. At any rate, the stakes would still remain good, and these are the most expensive part of the things composing a dead hedge.

391. I have before mentioned the great utility of the Locust in the making of *pins* in the putting rafters together, or in the fastening of rails into posts. However small, if big enough for a pin, the youngness of the wood is of no consequence; for the young is nearly as durable as the old. Teeth for the heads of wooden rakes; stuff to split into little pales for making hurdle gates for sheep; stuff for espeliers for gardens: all these would come out of the cutting down of a Locust coppice. No part of it, except the mere brush, would fail to answer some valuable purpose; and even the brush, though it be green, burns better than the brush of any other wood that I know any thing of, the Hickory only excepted.

392. I then bring to a close this very long article, but, I trust, not longer than it is interesting, by repeating my earnest exhortation to all those who plant trees, to examine well all that I have said upon the subject; and if they do so examine, I am sure that the result will be, that this fine and most valuable tree will become common throughout the whole kingdom.

LOCUST (HONEY).

In Latin, *Gleditsia Triacanthos;* in French, *Fèvier.*

393. The botanical characters are:—It has male and hermaphrodite flowers in the same katkin, and female flowers in different plants. The male katkins are long, compact, and cylindrical, and have each a three-leaved small empalement; they have three roundish petals, which spread open in the form of a cup; they have a turbinated nectarium, the mouth of which, afterwards, grows to the parts of fructification; they have six slender stamina, which are longer than the petals, terminated by oblong compressed summits. The hermaphrodite flowers in the same katkin are situated at the end; these have empalements, petals and stamina like the male; and have a germen, style and seeds like the female, which are situated in different trees, and are disposed in a loose katkin; these have a five-leaved empalement, and five oblong petals, with two short thread-like nectariums, and a broad germen longer than the petals, supporting a short reflexed style, crowned by a thick stigma. The germen afterwards becomes a large flat pod, with several transverse partitions, having a pulp in each division, surrounding one hard roundish seed.

394. This is sometimes called the Sweet Locust; but Honey Locust is its general name in America. This tree seldom attains a height exceeding fifty feet. It is a very beautiful tree, having the leaf very much resembling that of the sensitive plant, and keeping fresh and perfectly green all the summer. The French, when they took possession of

Canada and the Mississippi, gave it the vulgar name of *Fèvier*, because they found it bearing its seed in a pod a good deal resembling a very long and narrow-podded bean, that kind of bean, which, in French, is called *Fève*, or *Fève de marais*. The tree seldom gets to be more than a foot and a half through at the butt. MICHAUX says, that the timber is not valuable, and that the tree, besides its value in the ornamental way, is principally valuable for the forming of hedges; and this is, in reality, its great use. The plant comes up quickly, grows fast, has numerous branches, and those very fine; full as fine as those of the HAWTHORN; and these branches are armed with thorns, which, as MICHAUX says, render the hedge perfectly impenetrable. Each thorn is nearly two inches long, stout at the bottom where it starts from the branch, and regularly diminishing in size till it comes to the point, which is as sharp as that of any needle that ever was made, and a great deal more difficult to break, or snap off. As if this single dagger were not enough, there come out at about half an inch from the bottom of the thorn, two smaller thorns, each about a third of an inch long, but one a little longer than the other. These two side thorns point in an angular line from the side of the main thorn; or, to speak more properly, the point of an acute triangle is formed by each of the little thorns, and one side of the main thorn. So that here is a dreadful weapon: here are three of the sharpest things ever seen in the world, pointing at every creature that approaches the hedge.

395. I will now speak about the mode of raising the trees; and then about that of putting them into hedges. The seed, which comes in a pod above described, is a great deal larger than the seed of the LOCUST: it is, I should think, more than three times as large. It is precisely as

hard; which is pretty nearly as hard as a stone. It must be had from America, for I have not the smallest idea of its ripening in England: but it may be had at a reasonable rate, and a comparatively small quantity will suffice for the making of a very considerable hedge.

396. The SEED is to be prepared for sowing by *soaking*, in precisely the same manner as is directed in the case of the LOCUST. You must pay the same attention to prevent the seed from bursting from over heat, and take all the precautions about watering, shading, and every thing else, just as pointed out in the case of the LOCUST, in paragraph 384. When the young plants come up, they are to be treated in just the same manner as is directed in the case of the LOCUST. If sown in good ground, and kept very clean, and managed properly throughout the summer, they would be eight inches high in the fall of the year. They need not be put into a nursery if your ground be ready for planting them to form a hedge. They are ready to go out at once, and therefore it would be useless to put them into a nursery.

397. As to the manner of planting the hedge, in the first place the ground should be well trenched, and otherwise prepared. The young trees should then be planted in two rows, one row being about fifteen or eighteen inches from the other. The plants should be about fifteen or eighteen inches apart in the row, and the plants in one row standing opposite the middle of the intervals of the other row.

398. This work of planting may be done either in the fall or in the spring. The ground ought to be kept quite clear from grass and weeds the first year

after planting. If all be done well, the trees, without being cut down, which they ought not to be till they have stood a year, will make good shoots, and will particularly increase in size of stem. The next spring; that is to say, after they have stood a year, you cut them down close to the ground. Each will then send up three or four stout shoots. When these have grown through the summer, take out any little weak shoots close to the stem, and cut down the stout ones to within three or four inches of the ground. Out of these stems will now come such quantities of shoots, that the fence will be complete in a very short time, and only want trimming, clipping and the like, according to your fancy. The whole of the space, between the two rows, will be filled up by side shoots; and the hedge will be quite impassable by any animal bigger, at any rate, than a rat or a cat. It would remain quite undisturbed; for nobody and nothing, made of flesh and blood, would attempt to assail it; and, besides all the rest, the foliage is so very fine, that even as an ornament, it would be desirable to have it in a hedge. Our hawthorns are very beautiful; in loose hedges they have bloom as well as leaf; but we have to set against this the early fading of their leaves, their great liability to be attacked and devoured by caterpillars, and all the ugliness, and indeed injury, arising from that circumstance. Now, the leaf of the Honey Locust is attacked by no insect, and its green is as fresh in August as it is in May. As a plant to form a hedge, this surpasses all others, and for that use I strongly recommend it, and hope to see it become of very general use.

MAPLE.

In Latin, *Acer;* in French, *Erable.*

399. The botanical characters are :—The impalement of the flower is monopelatous, coloured and cut into five sharp segments at the brim, and is permanent. The corolla is compoed of five oval petals which spread open and are larger than the empalement. It has eight short and awl-shaped stamina, crowned by simple summits. The germen is compressed and immersed in the large perforated receptacle. The style is slender; it having two acuminated stigma, which are reflexed. The capsules are two, joined at their base; they are roundish, each being terminated by a large wing, inclosing one roundish seed in each.

400. There are many varieties of the MAPLE; and some of them are very beautiful trees. Our SYCAMORE is a MAPLE, and is called by the French the GRAND ERABLE, or *Great Maple.* We have a Maple in our woods; it is a very tenacious inhabitant of coppices, hedge-rows and hedges; a very hardy thing, makes very good fuel, in fagots; but it makes no poles, no hoops, no rods, no hurdles; and it scarcely ever becomes a tree as big as one's thigh. It is mere brushwood; and of no more use as a tree, than the poppies, or wild parsnip, or wild carrot, are as cattle-food. Our MAPLE is a weed of the woods, and we burn it, because we know not what else to do with it.

401. The AMERICAN MAPLES are in great and beautiful variety; and our own SYCAMORE is a very fine and stately tree, grows to a great size, is wonderfully hardy, and loaded with an uncommon portion of leaf. There is no tree, I believe, that has so great a weight of leaf in proportion to its height and size as the SYCAMORE. It will, too, grow in any soil, even the shallowest and the worst. It is fre-

quently seen on the bleakest hills throughout the high parts of Hampshire and Wiltshire, where it appears to have been left quite alone by the destruction of all other trees around it.

402. The timber of our SYCAMORE is white and soft, and not valuable by any means; this is not the case with the AMERICAN MAPLES, which produce some of the finest wood in the world. However, the manner of raising the plants is the same in all cases. No man ever dreamed of raising English Maple; but our SYCAMORE is constantly raised in great numbers, and it is hardly to be believed, that any nurseryman ever raised them, except from seed. I will first give an account of raising of MAPLES from seed, and of managing them until the time of planting out; and then, when I come to speak of the several sorts of AMERICAN MAPLE, I will give my opinion respecting the forming of plantations with them. They are most beautiful trees, varying very much as to their leaf and their form, and they produce not only the sugar, of which so much has been said, but some of the most beautiful wood, for various purposes, that ever was seen in the world.

403. The SEED of the Maple resembles somewhat the seed of the ASH. That of our SYCAMORE comes in pairs, each seed having a broad wing, and a pair of the seeds the boys call *spectacles*, which they are not much unlike, and which, pressed upon the nose, will hang on there, like an old-fashioned pair of grandmother's spectacles. When the seeds are ripe, they should be gathered, made perfectly dry in the sun; and sown in beds in the month of November, in the same manner as directed for the *Ash:* all the rules there laid down are to be followed with the greatest exactness in this case.

404. There are several of the MAPLES, the seed of which do not come up the first year; and they will not come up the first year, do what you will to them. The safe way, therefore, is, as some do, and some do not, come up the first year, always to sow in the month of November, in the manner above directed. If they come up the first year, it is well; if they do not, they will be apt to come up *very early* the second year; and if a sharp frost come just after their coming up, it will assuredly cut them off; so that you must watch them well throughout the months of February and March, and if you see frosts approaching, you must cover the beds to protect the plants.

405. When the plants are up, they must be weeded with the greatest possible care; and kept well weeded, and the earth stirred amongst them a little, during the whole summer. In the month of October, they will, if they have been well taken care of, be more than a foot high; and, then, they are to go into a nursery in the same manner as directed for the Ash. They have very good and bushy roots; they move extremely well, and grow very fast. They should be sorted in the manner directed for the ASH; in order that the plants of the same height and size may stand together; and may be ready to be taken out to go into avenues or plantations, without any more sorting. The small ones may stand in the nursery a couple of years; but the large ones should stand there but one year; for the younger they are when they go out, the greater their progress, the straighter their form, the larger and loftier they become, and the more durable their lives.

406. If put into plantations, the distances ought to be rows four feet apart, plants four feet apart in the row, those of one row to stand opposite the middle of the intervals in

the other row. The Maple would not be of much value as poles; but young trees of this sort would be of more value than the common Fir, at any rate; and, in order to have a wood of Maples, the thinning out at different times must be carried on precisely in the same manner as directed for the *Beech*: to which directions the reader will be pleased to refer. As to the felling of the Maple, like other deciduous trees, the bark of which is of no value, it ought to be done while the leaf is off. Nothing good comes up from the stem of the Maple, and therefore it ought to be grubbed up roots and all, that the ground may be employed with something else.

407. The *American Maples* are worthy of particular attention. The wood of most of them, as I have said before, is singularly valuable. There are seven of them. First, the WHITE MAPLE (*Acer Eriocarpum*); second, the RED FLOWERING MAPLE (*Acer Rubrum*); third, the SUGAR MAPLE (*Acer Saccharinum*); fourth, the BLACK SUGAR MAPLE (*Acer Nigrum*); fifth, the MOOSE WOOD (*Acer Striatum*); sixth, BOX ELDER (*Acer Negundo*); seventh, MOUNTAIN MAPLE (*Acer Montanum*). The first of these is whitish on the under side of the leaf: it does not attain to a very great size, and the wood of it appears, from MICHAUX, not to be very valuable; but it is a very beautiful tree, and the wood is sometimes used for the inlaying of furniture. The second, or RED FLOWERING MAPLE, is a tree which rises to the heighth of seventy feet; it grows best in very moist ground; and in New Jersey and Pennsylvania there are extensive marshes, called *Maple Swamps*, entirely covered with this tree.

408. The wood is made use of for many purposes, especially ornamental furniture. It is this tree which produces

what is called the "CURLED MAPLE," famous for its beauty throughout the United States. I have a chest of this wood, the boards of which are about two feet, or rather more, broad. Each board, if the chest were taken to pieces, is fit for the making of a very beautiful table. MICHAUX says, that, before mahogany became generally fashionable in the United States, the finest furniture was made of RED FLOWERING MAPLE, and that bedsteads are still made of it, "which in richness and lustre exceed the finest mahogany. "At Boston, some cabinet-makers saw them into plates "for inlaying mahogany. But the most constant use of "the Curl Maple is, the forming of stocks for fowling-"pieces and rifles, which, to elegance and lightness, unite "a strength resulting from the accidental direction of the "fibre." I have received, this year, some gun-stocks of this wood, and also some BROOM CORN BROOMS, the handles of which are of this wood. A broom and a gun-stock may be seen at my shop at Fleet-street, and, after seeing which, the reader will want no further inducement to endeavour to rear some of these trees; but it must be again observed, that the tree does not attain to any considerable size, except in land approaching to a swamp or marsh.

409. The third sort, or SUGAR MAPLE, is sometimes called a Rock Maple, or Hard Maple. It is a native of the colder parts of North America, and is nowhere more abundant than in Canada, New Brunswick, and in that miserable country Nova Scotia, or New Scotland. It rises to the height of from fifty to eighty feet, but does not attain a very great size of trunk. The wood of this tree is used by wheelwrights for axle-trees and spokes, and for various other purposes of great and general utility. Besides this, it produces most beautiful wood for cabinet use; which wood has been, and is, called by cabinet-makers, the

Bird's-eye Maple. It is most highly valued for inlaying mahogany, for making bedsteads, portable writing-desks; and is indeed looked upon, I believe, as wood exceeding all others in beauty. But, the great use of this tree might be the making of sugar. I remember seeing several trees in *Nova Scotia* which were under the operation of sugar-making. This work is begun in the month of March, long before the snow quits the ground in Nova Scotia. Little troughs are placed against the tree, which have perforations made in them eighteen or twenty inches from the ground, the perforations being made in an obliquely ascending direction. Care should be taken that the augers do not enter more than half an inch within the wood. Tubes are put into the holes, to conduct the sap down into the troughs. The sap is every day collected, and temporarily poured into casks, from which it is drawn out to fill the boilers. The evaporation is kept up by a brisk fire, and the heat is maintained until the liquid be reduced to a syrup, after which it is left to cool (having been carefully skimmed during the boiling), and then strained through some thick woollen stuff, to separate the remaining impurities. Maple sugar, manufactured in this way, "is (says MICHAUX) lighter "coloured, and in proportion to the care with which it is "made, and the judgment with which the evaporation is "conducted. It is superior in quality to the brown West "India sugar, generally used in the United States: its "taste is as pleasant, and it is as good for culinary pur-"poses.. When refined, it equals in beauty the finest sugar "used in Europe; but, from prejudice, it is made use of "only by the people where it is made. Wild and domestic "animals are inordinately fond of the Maple juice. I feel "authorised in recommending this tree for propagation in "all the northern countries of Europe." Now, as these facts are incontestible; as sugar is become a sort of neces-

sary of life; as we never can have *cane* sugar without the help of slaves; seeing that nobody, without dire compulsion, will work in the producing of it; what a noble opening is here for the indefatigable exercise of the humanity of Mr. BUXTON and his associates! It is now about fifty years, I believe, since MASSA WILBERFORCE commenced his eulogised labours in favour of the blacks. If he had then caused a hundred quarters of Sugar Maple Seed to be brought from NOVA SCOTIA, which he might have done at a thousandth part of the expense that silly people were put to in purchasing the *Negro* tracts in the course of one year; and if he had caused those seeds to be sown, and all the *humane people* had joined together in causing the trees to be planted and cultivated, there would have been more sugar raised in England at this time than would have been necessary for twice its consumption. But, is it too late now? It never can be too late to do good; and here is good unequivocal. The tree would first give sugar, and, when cut down, make beautiful tables to use the sugar upon; beautiful chairs to sit upon while sipping the sugar; and besides this, MICHAUX tells us that "the ashes of the "SUGAR MAPLE are rich in the alkaline principle," and that "it may be confidently asserted that they furnish four-fifths "of the *Potash* exported to Europe from BOSTON and NEW "YORK." Nor do the virtues of this tree end even here; for MICHAUX says, that the CHARCOAL of this wood is preferred to every other, it being heavier, and of course stronger, and it must therefore be the best for the manufacture of that article, in the making of which our old despised DOG WOOD has become so highly esteemed, which article is so notoriously efficacious in the thinning of a "*surplus population*," an object which now appears to be so near to the hearts of his MAJESTY'S FAITHFUL COMMONS.

410. The fourth, or Black Sugar Maple, differs very little from the Common Sugar Maple; but, as a tree, it has a more ample foliage than the other, and is very proper for the forming of avenues and adorning parks and gardens.

411. The fifth sort is called the Moose Wood; in some parts of America it is called the Striped Maple, which is descriptive of the bark of the tree; but it was called Moose Wood by the first settlers, because, the Moose (an enormous Deer) was observed to subsist during the winter and the spring upon the young twigs of this tree. It is a tree that grows extremely fast, and is very beautiful as a tree. The wood is white, and does not appear to be very valuable. Its principal use in its native country is furnishing the farmers, at the close of the winter, with the means of sustaining their cattle. It is amongst the very earliest trees in America, whose vegetation announces the approach of spring. As soon as the buds begin to swell, the horses and cattle are turned into the woods to browse the young shoots; and, poor as this resource may appear, it is a very great one, since the twigs are full of saccharine matter. In England this tree can hardly be planted except for ornament, but it is a very fast grower, and very ornamental.

412. The sixth sort, or Box Elder, or Ash-leaved Maple, does not mount to a great height; Michaux does not appear to attach any very great importance to it, but regards it merely as an ornamental tree. It grows very fast, and is very pretty. This is not saying much in its favour, and I cannot very well see why Michaux recommends it to be planted in coppices, to be cut every *three or four* years,

when, he says, "It would afford a profitable product in its "*sprouts*." The translator of MICHAUX was a son of an *American senator*, and I have not MICHAUX in French, at hand. Mr. JAMES HILLHOUSE (the translator), who dedicates the translation to his father, whom I had personally the honour to know, as the most long-winded and pointless speech-maker that I ever happened to hear of, save and except our own Mr. BROUGHAM. This Mr. JAMES HILLHOUSE, the translator, little imagined that he would make the mouths of our Cockneys water, when he was talking of whole coppices of "*sprouts*," which, to a certainty, they would interpret into those delightful things, which, under the names given to the shoots that come from the stumps of plants of the *Bressica* kind, and which are always at hand in every season of the year, cause such abundant employment and custom to the apothecaries and druggists and the vinegar and pepper merchants of every part of this wonderfully populous kingdom.

413. The seventh and last sort, is the MOUNTAIN MAPLE, which I have seen a great many times in America, but never saw it of a height above eight or ten feet. It appears to have no properties that render it valuable; but it is a very pretty shrub, and I could not refrain from mentioning it on this occasion, in order to include *all* the American Maples.

THE MOUNTAIN ASH.

In Latin, *Sorbus;* in French, *Sorbies.*

414. The botanical characters are:—The flower has a spreading concave permanent empalement of one leaf, indented in five parts; it has five roundish concave petals, which are in the empalement, and about twenty awl-shaped stamina, which are also inserted in the empalement, terminated by roundish summits. The germen is situated under the flower, supporting three slender styles crowned by erect-headed stigmas; it afterwards becomes a soft umbilicated fruit, enclosing three or four oblong cartilaginous seeds.

415. This is neither timber-tree nor underwood; and I mention it in this book only because it is found here and there in almost all our coppices. I know of no utility that belongs to it, and cannot guess at the reason for calling it an ASH, which it resembles in no respect whatever. It is planted, as an ornamental shrub, merely on account of its large bunches of red berries, which it bears in great profusion, and which hang on till a late season of the year, unless the birds be very much pressed for food, and then the berries disappear very quickly.

416. This tree throws out a great number of *suckers,* and from these it is generally propagated. The SUCKERS are dug up when small, put into a nursery for a year or two, and then planted out where they are to stand. But, a great part of the merit of this shrub, consists in its being somewhat lofty; and to have it lofty, and with a straight trunk, it ought to be raised from seed. The seed, like that of the HAWTHORN, has a pulp on the outside, a hard shell next to the pulp, and within the shell is the kernel.

417. The seed ought to be gathered when ripe, and then managed and sown in the same manner as directed for the seed of the Hawthorn. Sometimes, however, the seed of the Mountain Ash will come up the *first year;* and, therefore, as the space required for the sowing of this seed will necessarily be small, it may be as well to sow it, very nearly, as soon as it is gathered. If the plants come up the first year, or only a part of them, it will be sufficient; for a great number of such plants never can be wanted.

418. When the plants come up, they must be carefully weeded and kept clean throughout the summer. In the fall they will be nearly a foot high, and then they ought to go into a nursery for two or three years. Not more than three; and then, when planted out, it will not be necessary to cut them down the year after planting, for they have very good roots to remove; they strike off quickly; and if planted in the month of November or in March, the roots will supply the plants with sap, without any cutting down. If you wish the tree to be lofty, you must prune off the side-shoots, as the plant advances in height, in the manner directed in paragraphs 127 and 149. When it has got the height of clear trunk that you wish it to have, you leave off pruning, and the tree then presents you with a spreading and ornamental head.

THE OAK.

In Latin, *Quercus;* in French, *Chêne.*

419. The botanical characters are:—It has male and female flowers on the same tree; the male flowers are disposed in a loose katkin; these have an empalement of one leaf, divided into four or five segments; they have no petals, but many short stamina, terminated by large twin summits. The female flowers, which sit close to the buds, have a hemispherical thick empalement of one leaf, which is rough and entire, almost hiding the flower,

which has no petal, but a small oval germen supporting a single five-pointed style, crowned by single permanent stigmas. The germen afterwards becomes an oval nut, or acorn, with a thick cover, having one cell, the base of which is fixed into the empalement or cup.

420. The family of Oaks is numerous indeed. Perhaps there are ten or a dozen different varieties amongst the native Oaks of England, each somewhat distinguished from all the rest, whether by the shape of the leaf, the size of the leaf, the colour of the leaf; by the size, colour, or shape of the acorn. If you stand upon a hill, and look down upon a pretty large Oak wood, which you do almost anywhere in the Wealds of Surrey, Sussex, or Kent, at any season of the year, from the time that the bud begins to open until the leaves be completely off, you will perceive that there is a very great variety of Oaks. You will see one sort nearly in full leaf, when the buds of other sorts are only beginning to burst. In the autumn you will see some of the trees retaining their perfect green, while others are wholly without a leaf. In the middle of summer some trees are of a dark green, others of a pale green; so that, in all probability, if the thing could be exactly ascertained, there is as great a variety of Oaks in England as there is in America; but, at any rate, the manner of propagating, planting, training up, and applying all *deciduous* Oaks, are one and the same; so that, in giving directions for these works, with regard to the common English Oak, I shall be giving directions for the propagation and management of all Oaks, except the American *Live Oak;* which is an Evergreen, or rather one of the Evergreen Oaks, and which will demand a different treatment.

421. As to the outward appearances of the Oak tree, its general height and size, the uses of its bark as well as of its timber; these are all as well known to us, as are the outward appearances, the size and the uses of the grain of

which our bread is made; but how to take an acorn, and go to work with it in that way which is best calculated for the producing of the timber and the bark, is not so well and so generally known: it is my business, therefore, to communicate to my readers the knowledge which I possess on the subject, reserving an account of the different sorts of Oaks, and of their different qualities, to follow the directions which are applicable to all.

422. The Oak is raised from seed, and from seed only; and that well-known seed is the acorn. Acorns are to be picked up under the Oak trees in the month of November; but you must take special care that *the pigs* have not been under the trees before you; for if they have, and if the quantity be not much greater than they can devour, they will, as in the case of the BEECH nuts, leave you not a single acorn that will grow. The best way is to *try* them in the manner directed in the case of the BEECH, to which the reader will now please to refer.

423. Acorns might be sown as soon as picked up, were it not for the mice; but, except in very well guarded situations, they would, if sown in the fall, be nearly all devoured before the spring; and even if sown in the spring, in an open field, or any unguarded spot; any spot where the mice would find near and convenient shelter, as in a bottom of a hedge, or in rough grass, they would generally leave but few of the acorns untouched. If, therefore, you have a mind to succeed in the raising of Oak plants, you should make your beds in a piece of ground, which has no such shelter near it.

424. The spot having been chosen judiciously, the next thing is to prepare the ground well, and then to lay it out

into beds, in the manner directed for the Ash in paragraphs 109 and 110. The beds being prepared, you begin the sowing; but I must first speak of the manner in which the acorns are to be *preserved* until the time of sowing. When you have picked them up, and have ascertained that they are good and sound, you first make them perfectly dry in the sun. When that is done, mix them with very dry sand, three bushels of sand to one bushel of acorns; put them into barrels or boxes, or into something which will keep them pretty much from the air, and, at the same time, quite dry, and there let them remain until the middle of March, which is the proper time for sowing.

425. Returning now to the act of sowing, you take the sand, acorns, and all together, scatter them over the beds in such manner, that they lie at about two inches apart. Then pat them down into the ground with the back of the spade, and cover them with earth taken out of the alleys, so that the acorns have about an inch and a half of depth of earth lying upon them. The earth should be broken very fine, because, if it be in lumps or clods, the shoot from the acorn, on which a clod lies, runs along horizontally under the clod, finds its way up, when it gets to the outside of the clod, and continuing to grow in this shape, will give you a plant with a crooked root, which will never become straight, and which you will find very injurious.

426. The plants will come up in the month of May, when they must be kept clear from weeds. The ground ought to be stirred between them two or three times in the summer, when the weather is dry, and especially after a heavy rain. This management will cause them to be two inches higher in the month of October, than they would be if suffered to remain without any stirring of the ground. In the month

of November they should be put into a nursery, in rows at eighteen inches apart, and at about eight inches apart in the row, the work being done in the same manner as directed for the Ash, in paragraph 120, 121, and 122. But very great care must be taken, with regard to the roots. The Oak sends down a tap-root, like the Hickory, but not so long. This tap-root has a few feeble fibres hanging to the sides of it. It is next to impossible to put this root at full length, straight down into the ground; and if you were to do it, it would be of no use, for the fine point of the root would be sure to die. You must, therefore, cut off this tap-root with a sloping cut by a sharp knife, so as so make the root six inches in length, from the point, where, before its removal, it touched the surface of the ground. A new tap-root will come, in somewhat the same way that a new shoot will come from the cutting down of a young tree; but side-shoots will also come out of the root which you will put into the ground; and these will make the tree more fit for removal into plantations.

427. In this nursery the trees ought to stand for two years, or perhaps for three; because the Oak requires more time than trees in general to regain its roots. You will, as in the case of the Ash and all other trees, *sort* or *size* the plants before you put them into the nursery; and the largest size may be fit for plantations a year sooner, or perhaps two years sooner, than those of the smallest size.

428. While standing in the nursery, the side-shoots should be pruned off, in such manner as to keep the plants from getting too large a head; for that large head prevents the stem from becoming stout; and it is stoutness in the stem that is wanted. As to the shape which the young trees take, that is not of much consequence; for, after being planted

out into plantations, they ought to be cut down to the ground, as will be seen by-and-by.

429. The next operation is to remove the trees to the spot where they are destined finally to stand; and here we have to speak of the *soil* proper for Oaks. There are some of the American Oaks that seem to prefer a soil with a dry, gravelly, sandy, or stony bottom; but our English Oaks delight in the sourest of clay, yellow clay, blue clay, or any clay that is constantly wet and sour. The young plants, however, want another sort of soil to strike into at first; and their roots stand in need of that fine earth, which is not to be obtained amongst clays. Even when they are put out into plantations, there should be some fine broken mould for them to strike off into. The ground, though a clay, should be trenched, after the manner described in paragraphs 18, 19, 20, and 21; particularly as described in paragraph 21, which gives directions for the deep moving of the ground, but still for the keeping of the top soil at top.

430. The ground being ready for planting, the trees should be taken up out of the nursery with the greatest care, the roots pruned, after the manner described in paragraphs 72 and 73, and the plants put in, in the manner described in paragraph 75. Before they be planted they may be cut off, not so closely as is represented in figure 2, opposite paragraph 74; but the head ought to be shortened, and the side-shoots shortened also, in order to prevent the young trees from being loosened in the ground by the wind, before they have taken root.

431. In this state, the ground being kept clear from weeds, the Oak should stand *two years* before it be cut down; because, as was observed before, it is longer in

taking good firm root, than any other *deciduous* tree, the HICKORY excepted. At the end of two years, the trees will be but scrubby looking things, but they will be fast in the ground, of which their roots will have got good hold, and their stems will have increased in stoutness. Now, therefore, the ground having been kept perfectly clear of weeds, they ought to be cut down, with a sharp knife, nearly close to the ground.

432. This will cause new shoots to come up from them, which will go up straight; and you must be careful to take off, from each stem, all the shoots but one, leaving that one, which of course will be the strongest, to go up and become the trunk of the tree. The next year, this shoot will send out side-shoots, which must not be taken off until they have had a year's growth. Then the lower ones should be taken off, by means of a sharp knife and a close cut; and thus, every year, as the top of the tree rises higher and higher, the lowest of the side-shoots should be taken off, until you get your stem or trunk clear and straight to the length that you desire to have it. It is not always desirable to have a long trunk, and a small head in proportion, of course. The bark forms a great part of the value of the Oak; and it frequently happens, that an ugly-looking tree, with a great number of limbs, is more valuable than a handsome, and even a larger tree with few limbs. Besides, a straight trunk furnishes none of those *knees*, which are so valuable in the making of ships, and frequently in the making of houses. In hedge-rows, therefore, where there is plenty of room, there seems to be no good reason for endeavouring to obtain a trunk of great length; and, of course, the pruning there ought to be accordingly; but if trees be to stand in a wood, they ought to be pruned so as to give room for their growing to a considerable height.

433. Now, as to the *distances*, at which OAKS ought to be planted, much must depend on the object which the planter has in view. Generally speaking, the trees cannot come to any thing worthy of the name of timber, unless they stand at from twenty to thirty feet distance from each other; for, at this distance their heads will all meet at the end of about thirty years. But, what is to be done with the rest of the ground in the mean while? for, it would be very unprofitable work to employ an acre of ground for thirty years in the raising of about *eighty* trees, which would not probably be worth more than three or four pounds a-piece. To plant OAKS after the manner directed for ASH and some other trees, and to keep thinning out until you got to the eighty to an acre, would, it appears to me, be nearly as unprofitable a thing as could be done; for, though from the stools of the trees cut down, there would come a coppice, an OAK coppice is absolutely good for nothing but fuel. It makes neither hoops nor hurdles; and even the young trees that would be taken out, when they attain the height proper for poles, would be good for nothing in that capacity. The young trees, when taken out at a larger size, would be good for little, seeing that they are almost all sap, which has no strength and which is rotten a year or two after it is cut down. Their chief value would be in the bark of the trunks, and this would not amount to much.

434. Therefore, if I had to make a plantation of OAKS, I would put them in rows, twenty-five feet apart, and twenty-five feet apart in the row, placing the plants of one row opposite the middle of the intervals of the other row. Then I would have four rows of HAZEL, at five feet apart, and at five feet apart in the row, between every two rows of OAKS, and four HAZEL plants between every two OAKS in the row itself. The HAZEL would rather, perhaps, outgrow the

OAKS; but it would shelter them at the same time; and where the HAZEL interfered too much with the Oaks, it might be cut away with the hook. By the time that the Hazel coppices were fit to cut for the first time, the Oaks would have obtained a considerable height; perhaps eight or ten feet. This would give them the mastership of the HAZEL; and, after the second cutting of the HAZEL, there would begin to be an Oak wood, with a HAZEL coppice beneath; and in the mean while the coppice would have produced very nearly as much as it would have produced, if there had been no Oaks growing on it. By the time that four cuttings of the Hazel would have taken place, the coppice would be completely subdued by the Oaks. It would produce no more hoops or hurdles; but then the Oaks would be ready to afford a profit.

435. I have heard, of the planting of *Scotch Firs* as nurses to the OAKS, and I saw an instance of this upon a small scale in a plantation in the New Forest; but, the Firs grow a great deal too fast for the OAKS; and though they shelter them, they draw them up into too slender a size at the same time. It is a sort of shelter, which is too much for the OAKS; and, while the Firs do not produce a crop equal in value to the tenth part of a HAZEL coppice, they cannot, when once cut down, be renewed. They draw away the goodness of the ground, as long as they exist, more than the HAZEL; and in short, in every point of view, they are, as nurses to OAKS, inferior to the other.

436. The other way of raising Oak plantations is by sowing the seeds in ground previously well ploughed or digged; or indeed trenched, which is still a great deal better. Drills are made by a drill-plough, or by the hand, and the acorns put along the drill and covered over; in this case,

if the plants succeed, great numbers must be cut out, or grubbed up, and the underwood can be nothing but OAK, which, as before observed, can be good for little. I know a plantation, or rather a wood, formed in this manner, except that the acorns were sown broad cast, instead of being sown in drills: this wood is very near to the village of Botley, on an estate which belonged to the late Mr. CLEWER of that village. The acorns were sown, as Mr. CLEWER told me, about *sixty* years ago. I had, for years, frequent opportunities of looking at this wood, which is situated at the top of the hill, by the side of a lane, leading from Durley Mill to Curdridge Common. But, in the fall of 1826, I rode up that lane, took particular notice of the trees, and could not see one which I thought to be any thing near forty feet high, and not one of the size worthy of being called *Timber*, though the land there, and all round the neighbourhood, is remarkably good for the growing of OAK. If a regular plantation had been made on that same land, at the time when these acorns were sowed, I am convinced that there would now have been many trees worth ten pounds a-piece. The truth is, that such a mode of raising OAKS is rather slower, than suffering them to come up as they can amidst the underwood of the coppices; and, the absurd practice can have no other foundation, than that of an erroneous notion that it is a saving of expense. These OAKS of sixty years old are nothing more than miserable saplings at this hour.

437. As to the pruning of Oak trees when they become large, this never should be done by cutting a limb of any considerable size off close to the tree. If so cut off, the bark will generally, in time, cover the cut; and you will frequently see, in large Oak trees, a covering of this sort, eight, nine, or twelve inches in diameter; but though you

get a covering of bark over the cut, you leave a piece of dead wood beneath that bark, which, when the tree is sawed out, discovers itself in the greatly inferior value of the board or plank; and, though you disguise the fact to common eyes, you cannot disguise it to the eyes of the timber-merchant, who is sure to make a note of the circumstance in his survey previous to the purchase of the tree. When, therefore, you are compelled by some circumstance or other, to take off a live limb of any considerable size, the best way is to cut it off at three or four feet from the trunk of the tree: if new shoots come out of the stump, the trunk will receive no injury. If the stump die, which is seldom the case, it will be years in dying, and in all probability would never injure the trunk. If there be a limb broken off by the wind, leaving a stump with a ragged end, cut back to the quick, which may bring out new shoots, and thus prevent injury to the trunk. If the limb be wholly dead, you must cut it out from the bottom; and if it be a limb of considerable size, the sooner you cut the tree down the better; but, if any part of the limb be alive, it will be that part which is nearest to the trunk; and when you have cut it back to the quick, you have done all that you can do to prevent the mortal disease reaching the trunk of the tree.

438. With regard to the *felling* of Oaks, the Oak which is cut in *winter* is much more valuable than that which is cut in *summer;* but as Oak wood is Oak wood, and as Oak wood and *Oak bark* will sell for more than the same quantity of Oak wood alone, we scarcely hear of such a thing as a winter-cut Oak. In order to have both; in order to have the skin as well as the body, and to have the body sound too, some persons have barked their Oaks standing, and cut down the trees the succeeding winter.

This was practised, sometimes, hundreds of years back; but, if it had been of any solid utility; if it really had, in the end, been attended with profit, the practice would have become general; instead of which, I never saw an instance of it in all my life. I have seen small OAK stuff, in the hedge-rows in Cornwall and Devonshire, thus skinned alive, and there may be here and there a man that applies the practice to large trees. But, at any rate, the practice is very rare, and very rare it could not be, if it were unequivocally profitable.

439. It is impossible that any reader, after being enabled to make the comparison, should not decide on making LOCUST plantations in preference to plantations of OAK. The LOCUST will grow in any soil except in a mere swamp; and, by looking back at my account of the tedious progress of the OAK, he will perceive that the Locust tree, at the end of three or four years from the seed, would be higher and bigger than the OAK tree at the end of twelve or fourteen years from the seed; and, when to this important consideration, are added the superiority in the quality of the LOCUST, and its great excellence in the forming of coppices or underwood, it is impossible for any man to resist the conviction tendered to his mind.

440. Having now given instructions for the propagation and management of the OAK generally; and believing that there is no essential difference in the quality of the different varieties of our English OAK, I next proceed to give an account of the American OAKS, first observing, however, that a sort of OAK very common in ornamental plantations in England, called the TURKEY OAK, is a very fast grower and a very beautiful tree, but produces, as I am informed, wood greatly inferior to that of our ENGLISH OAK. The

American Oaks are, according to Michaux, twenty-five in number; as follows: 1st. White Oak (*Quercus Alba*); 2d. Black Oak (*Quercus Tinctoria*); 3d. Red Oak (*Quercus Rubra*); 4th. Swamp White Oak (*Quercus Prinus Discolor*); 5th. Overcup White Oak (*Quercus Macrocarpa*); 6th. Chesnut White Oak (*Quercus Prinus Palustris*); 7th. Scarlet Oak (*Quercus Coccinea*); 8th. Black Jack Oak *Quercus Ferruginea*); 9th. Grey Oak (*Quercus Ambigua*); 10th. Mossy Cup Oak (*Quercus Olivæformis*); 11th. Post Oak (*Quercus Obtusiloba*); 12th. Over cup Oak (*Quercus Lyrata*); 13th. Yellow Oak (*Quercus Prinus Acuminata*); 14th. Small Chesnut Oak (*Quercus Prinus Chincapin*); 15th Bertram Oak (*Quercus Heterophylla*); 16th. Water Oak (*Quercus Aquatica*); 17th. Bear Oak (*Quercus Canisteri*); 18th. Barren Scrub Oak (*Quercus Catesbæi*); 19th. Pin Oak (*Quercus Palustris*). The foregoing are the deciduous Oaks. The Evergreens are, 1st. The Live Oak (*Quercus Virens*); 2d. The Cork Oak (*Quercus Subea*); 3d. The Willow Oak (*Quercus Phellos*); 4th. Laurel Oak (*Quercus Imbricaria*); 5th. Upland Willow Oak (*Quercus Cineria*); 6th. Running Oak (*Quercus Pumila*).

441. These Oaks all differ in some degree, and that degree pretty striking. The foliage of them all is beautiful, especially after it has been taken by the frost in the fall of the year. Some of these Oaks are represented as not growing much higher than a man's head; and one of them, not above a foot and a half high, when it is covered with acorns bending the branches down to the ground. But, I think worthy of recommendation, as trees to be planted in England, for the purpose of *Timber*, none but the White Oak and the Black Oak, amongst those of a deciduous character; and none but the Live Oak amongst those of the

Evergreens. A collection of the whole of the sorts planted on one spot would be a very curious object, and singularly pleasing to the eye; but, in this work, it is my business to speak of the useful only, and therefore I shall confine myself to the three sorts of Oaks just mentioned.

442. The White Oak (*Quercus Alba*) produces some of the most valuable timber in the world: it is as strong as our Oak, and almost as elastic as the Hickory itself. It is made use of in the making of almost all the implements of husbandry, in the making of coaches, in the making of sledges; and, in short, in the making of every thing where great strength and toughness is sought to be obtained in a small bulk. As a proof of its toughness and elasticity, it is made use of for many purposes to which we apply whalebone. A piece of White Oak, sawed out of a plank, and planed down to the proper size, makes a whip-handle; and, in America, the carters' long whips, which we make of whalebone, covered with leather or tarred thread, are made of White Oak. My correspondent in America has sent me a dozen of coach-whip handles made of this wood, first sawed out of a plank, and then planed or turned to the proper dimensions; and one of these whip-handles, together with a Hickory whip-handle, may now be seen at my shop at Fleet-street. If I were to give a description of all the uses to which this wood is put, I should fill half a volume with that matter alone. The tree attains the height of seventy or eighty feet, and it frequently rises still higher. It is, however, amongst the least curious and beautiful, in outward appearance, of the American Oaks. The leaf is but small, and the shape and colour not very handsome. I have found great difficulty in bringing the acorns of this Oak in a sound state to England. The shell of the acorn is

tender; the acorn ripens early in the fall, and if warm rains come in the month of November, which they very frequently do, the acorns still clinging to the tree, actually sprout before they are shaken down by the winds. I have not yet succeeded in bringing over any considerable quantity in really good order; but I think that, if they were beaten off the trees before they were *quite* ripe, then dried in the sun, and packed in very dry sand, they would come to hand perfectly safe and sound. The soil in which the White Oak delights is precisely that in which our English Oak flourishes best.

443. The Black Oak (*Quercus Tinctoria*). This Oak is adorned with a very beautiful leaf; very large, most curiously formed, of a fine green during the summer, then purple for a month, and then nearly scarlet for another month. This Oak flourishes in the poorest of soils, or, to make use of the words of Michaux, "where the soil is lean, gravelly, and uneven;" and yet it frequently attains the height of ninety feet, with a trunk four or five feet in diameter.

444. The wood is reddish, with empty pores; but it is, however, very often used for purposes for which the White Oak is used, when the latter cannot be easily obtained. The *bark* of this Oak is of great value, and many tons of it are imported into England annually from America. From parts of the bark of this tree is obtained the *Quercitron*, of which great use is made in dying wool, silk, and paper-hangings. According to several authors who have written on this subject, and among others, Doctor Bancroft, to whom, says Michaux, "we are indebted for this discovery, "one part of *Quercitron* yields as much colouring matter as "eight or ten parts of woad."

445. The wood is inferior in quality to that of our Oak; but its great height and size, the rapidity of its growth in the coldest of climates and the poorest of soils, and, above all, the value of its bark in dying, recommend it strongly to the notice of English planters. I should suppose that a wood of this Oak would come to be fit to bark in England in a very few years after the sowing of the acorns; and these acorns have a very thick shell, preserve well, and come from America in excellent condition. I have had the plants two feet high, and many of them more than that, in the month of October, after sowing them in the spring of the same year.

446. The Live Oak (*Quercus Virens*). Of all the Oaks, however, this is the one of the most value. It is evergreen, has smooth oblong leaves, of a deep green upon the upper side, and whitish on the under side. This tree grows well in England, and ripens its seed in England; there are several trees of it in the King's gardens at Kew, and I have seen acorns upon them in a very perfect state. The wood is as durable as that of the Locust; but it is a great deal heavier than that or any other wood that I ever saw. It does not afford large timber; but is extraordinarily prolific in those *knees* which are so very useful in the building of ships. I do not find that it ever grows in America to a much greater height or size than it reaches here. Michaux tells us that it flourishes best *near the sea*, and is proof against all storms and blasts. He frequently saw it upon the sea-beach, or half buried in the movable sands upon the downs, where it had preserved its freshness and vigour, though exposed during a long lapse of time to the fury of the winter winds and to the ardour of the summer sun. This tree naturally spreads its head somewhat in the form of a good stout, lofty apple-tree; this circumstance causes

it to produce such a quantity of *knees*. The American ships, when for *sale*, are said to be built of Live Oak and Red Cedar. Ninety-nine times out of a hundred such sayings are false; but the assertion proves beyond all doubt the great celebrity of the wood. Michaux tells us that it is sought after with most destructive eagerness, and that he considers its disappearance from the United States, within fifty years, as nearly certain.

447. I trust that it will make its appearance in England in proportion as it disappears in the United States; for, besides the utility of it, besides the great interest the country has in its cultivation here, it is a large and beautiful evergreen, not liable to be broken by the winds, every twig being as tough as a bit of rope; never flinching at the frost and snow, and affording the completest of shelters to gardens and houses.

448. With regard to the mode of propagating this famous tree, it can only be done from the acorns. I raised some from the acorns last year, but they were very few in number. One gentleman had them all; and perhaps he has more trees of the Live Oak than all the rest of the people of England put together, seeing that I think he has about two thousand. The acorns are sowed in the same manner as directed for the sowing of the acorns of the common Oak; they attain the height of from five to seven inches the first summer, and then they ought to be removed into a nursery, in the manner directed for the Red Cedar. But they need not stand two years in the seed-bed, like the Red Cedar. They must be taken out of the seed-bed with the greatest care; but, as to the removing of these trees, turn back to, and read with great attention, paragraph 215. The Live Oak ought to stand two years in the nursery, for

it will not make much of a shoot the first year; and then it ought to be planted out where it is to stand; for if planted out at a greater age, it will certainly be exposed to the risk of not taking root until the top of the plant be injured.

449. As to the preparation of the ground for the final plantation, it ought to be after the best possible manner; and the planting ought to be performed with extraordinary care, the wind and sun being kept from the roots as completely as possible; and the planting ought to take place early in the fall if it be convenient, or else in April, and the roots ought to be grouted if the weather be warm.

450. The Live Oak is never to be cut down, after the manner of deciduous trees. It must remain entire, for, if cut down, I much question if it would throw up new shoots. This circumstance points out the necessity of putting it into plantations when still very small; for, if large, the removal would prevent the root from being able to supply sap sufficiently for the first year. This does not so much signify in deciduous trees, because, by cutting down, you get a new plant when the root is arrived at a state sufficient to push it up and maintain it in vigour; but, as you cannot cut down this Evergreen Oak, you must be careful that it is never deprived of its due share of sap.

451. A plantation of Live Oaks would be a most beautiful thing, and valuable beyond all calculation. A *knee*, about the size and form of one's leg and thigh, when one is sitting in a chair with the heel at about a foot and a half from the chair; I mean the leg and thigh of a good stout man, however; such a *knee* would be equal in strength, and indeed a great deal stronger, and a great deal less liable

to break, than a knee of the same bulk, made even of Swedish iron, not to think of the rubbishy stuff, half sand and half ore, of which cast-iron things are composed. But the Live Oak is a spreading tree, though low of stature compared with ELMS and with other OAKS: it spreads about its head to a very considerable extent, and you do not want it with a straight and long trunk; you want it for the *knees*, and for other purposes where short lengths are sufficient; and therefore it ought to have room, and ought, indeed, to be planted in distances of twenty-five feet, in the same manner as I have suggested the propriety of making a plantation with the COMMON OAK. And here I beg to refer the reader to what I said, a little way back, upon that subject.

452. If the coppice were to consist of BIRCH, instead of HAZEL, it might in this case be as well; for the BIRCH would push up faster than the HAZEL, and would not throw out such a very great number of shoots from each stem. If the plantation be for ornament as well as for use, it is likely that the coppice would not be thought of; and then all that would be required would be an effectual fence, and constantly clean land. After the plants attain the height of seven or eight feet, a pruning of the lower side-shoots might take place, and this pruning might be continued until you had got a clear trunk from twelve to twenty feet high: then the head ought to be left to form itself into limbs, and those limbs to form themselves into *knees*.

453. The bark of the LIVE OAK is never heard of in tanning, and therefore the tree is always cut when the sap is down. The bark seems to be, indeed, nearly as hard as the wood itself; for you frequently see it on the edges

of planks and slabs at the end of twenty years after they come from the saw-pits. I never saw, that I know of, a broken or dead limb in a Live Oak tree. The twigs are so tough, and the limbs have so many minor limbs coming out of them, and they so firmly brace and support each other, that the wind seems never to have the smallest effect upon this tree; to cause an extensive plantation of which to be made in England would merit the title of Duke ten thousand times more than ten thousand battles of Waterloo.

THE PERSIMON.

In Latin, *Diospiros;* in French, *Plaqueminier.*

454. The botanical characters are:—It has hermaphrodite and female flowers on the same plant, and male flowers on separate plants; the hermaphrodite flowers have a large obtuse permanent empalement of one leaf, which is divided into four parts; the flower has one petal which is shaped like a pitcher, and cut at the brim into four segments, which spread open; it has eight short bristly stamina firmly joined to the empalement, terminated by oblong summits which have no farina. In the centre is situated a roundish germen, supporting a single quadrified style, crowned by an obtuse bifid stigma; the germen afterwards becomes a large globular berry, with many cells, each including one oblong, compressed hard seed. The male flowers have a one-leaved empalement, cut into small acute segments; the petal is thick and four-cornered, cut into four obtuse segments, which turn backward; they have eight short stamina, terminated by long, acute, twin summits, but have no germen.

455. This tree, which is found in almost all parts of the United States, does not rise to a great height; but it sometimes reaches that of sixty feet, with a diameter of eighteen or twenty inches; and I am mistaken, if I have not seen it

several times much higher and bigger. The leaves are from four to six inches long, of a beautiful green above, and of a whitish blue on the underside. It bears a fruit, a sort of plum about the size of our largest cherries, and bears it in prodigious quantities. The fruit is of a pale red, in the fall of the year, and when the frost has nipped it, it frequently is eaten.

456. The wood of this tree is very hard, strong and elastic. Michaux says that it is used at Baltimore, in the making of large screws, and by tinmen for making their mallets. It is employed to make the large wedges, which assist iron wedges in the splitting of the trunks of trees; for the making of the shafts of chaises it stands before every other sort of wood except the lance-wood of the West Indies. So that, taking ornament and use together, this is a tree very well worthy of our attention; and as to the propagation of it, nothing can be more easy.

457. The seed is easily obtained from almost any part of the United States. Several seeds are contained in each of the little sort of plums above described. They are as hard as a bit of pewter, and pliable like a little bit of pewter. They ought to be sowed in the month of March or April, in just the same manner as directed for the Ash. When scattered on the seed-bed, which they may be very thickly, they ought to be pressed down by the back of the spade to settle them firmly in the ground, and then covered with earth taken out of the alleys, which earth ought to lie on the beds a little more than an inch deep, and ought to be made very fine in order to suffer the plants freely to come up, which they will do very boldly, just in the manner of a kidney-bean, about the middle of the month of May.

458. It is a very bold plant; but, the beds ought nevertheless to be kept perfectly clean from weeds. If this be done, and if the ground be good, they will be from six to eight inches high in the month of October. In November, or in the succeeding month of March, they ought to go into the nursery, in the manner described in the case of the ASH, and at the same distances; but, though the root is very bushy, and has nothing of sap belonging to it, the plants must be removed with great care, to guard against the influence of sun or wind; because, this is a *hard-wooded plant;* and all such plants, except the LOCUST, as far as I know, require particular care in transplanting. They might stand two years in the nursery, unless you perceived them to make good shoots the first year; for unless you see a shoot made by the plant, you may be assured that the root has not done much in the way of shooting.

459. When they have stood two years at most in the nursery, they ought to go to the spot where they are finally to stand. Most likely few persons would ever think of Persimons except for clumps, for lofty shrubberies, or for independent trees. If put into clumps, they might stand at about six feet apart at first, and be thinned out when their want of sufficient room required it. If any one, ever should think of making a little wood of Persimons, they might be planted in rows of ten feet apart, the plants at ten feet apart in the row, and those in the one row standing opposite the middle of the intervals of the other row. There then would come a row of HAZEL or of BIRCH at five feet apart between each two rows of the Persimons, and one plant of HAZEL or of BIRCH between each two Parsimons, in the Persimon rows: and thus, a coppice would be going on, while the trees were growing

in height, in the same manner as has been suggested in the case of the OAK. As the trees advance in height, their lower side-shoots should be taken off, in such manner, as to secure a clear stem and a straight one, if possible, of eighteen or twenty feet long. That is long enough. The heads of the trees would then get pretty close together; there would be beauty above and profit beneath; beauty in the foliage and profit in the trunk.

460. The proper season of cutting down the trees is, of course; the winter; and of the qualities and uses of the wood, I have already spoken. I do not say that I recommend any one to make a plantation of PERSIMONS; but, it might be done upon a small scale at a very little expense; and if one were planting a coppice of BIRCH or of HAZEL, it might in fact be done at hardly any expense at all.

THE PLANE.

In Latin, *Platanus;* in French, *Platane.*

461. The botanical characters are :—It has male and female flowers growing separately on the same tree. The flowers are collected in a round bell; they have no petals but very small empalements, which have oblong coloured stamina, terminated by four-cornered summits. The female flowers have scaly empalements and several small concave petals, with several awl-shaped germen sitting upon the styles crowned by curved stigmas; these are collected in large balls. The germen turns afterwards to a roundish seed sitting upon the bristly style and surrounded with downy hair.

462. This is one of the trees in knowledge with regard to the propagation of which I pride myself; and the reader will see that it is not without reason, when he comes to that part of this article, in which I am to speak of the experiment made last summer in the raising of PLANES.

423. There are two distinct species of Planes: the Oriental Plane and the Occidental Plane; one belongs to Asia and the other to America. We have long had them both in England; sometimes very fine; but always less fine than they would have been, had they been raised from the seed. The ORIENTAL PLANE is that which *sheds its bark* annually or biennially. The bark peels off, by piecemeal, and new bark comes in its stead. The OCCIDENTAL PLANE does not change its bark in this manner. The trunk of the former tree is of a grey colour; that of the latter is rather of a greenish red. The leaves of the OCCIDENTAL PLANE are larger than those of the ORIENTAL PLANE; and it grows to a greater height and in a more erect manner: both are noble trees; and if they were raised from seed, instead of being raised from *Layers*, they would be full as large and lofty as they are in their native countries. MILLER relates that he has read of an ORIENTAL PLANE "which "was growing at a villa of the Emperor CALIGULA; the "trunk of which was so large, as, when hollowed, to make "a room therein, to entertain ten or twelve persons at a "repast, and for their servants to wait upon them." MILLER speaks of another of these ORIENTAL PLANES, which was of so great a magnitude, "that XERXES made his army "(which consisted of seventeen hundred thousand men) "halt for some days to admire the beauty and tallness of "this tree, which he called his mistress, his minion, his "goddess; and, when he was obliged to part with it, he "caused a figure of it to be stamped on a gold medal, "which he continually wore about his neck." Well would it be for some people, for some poor oppressed and miserable millions, if their Sovereigns delighted in mistresses, minions and goddesses of a character so inoffensive, and so little calculated to produce taxation and beggary. This tall and lovely goddess never meddled, I warrant her, in affairs,

which ought to be left wholly to men; never broke up councils, or frustrated political arrangements and plans; never squandered away a wretched people's earnings, either in decorating herself or creating fortunes for her minions. Happy subjects of XERXES! and success, say I, to those Sovereigns who are fond of trees, and who prefer them to goddesses made of corrupt flesh and blood, whether the goddesses be fat or lean.

464. The OCCIDENTAL PLANE does, perhaps, surpass in height and size that of the East. In America its common name is the BUTTON-WOOD, from the form of the ball containing its seed, a particular description of which I shall give by-and-by. To hear this vulgar, pitiful name, one would imagine that the tree must be but a pitiful tree; yet, it is the largest tree in the world; and as will by-and-by be seen, its seed is very little bigger than that of the lettuce plant. MILLER speaks of an OCCIDENTAL PLANE that had been known in America, to be thirty-six feet round; MICHAUX speaks of one, which was measured by himself and his travelling companion, and which they found on the right bank of the OHIO, thirty-six miles from MARIETTA, which measured, at four feet from the ground, forty-seven feet in circumference; and, of course, the diameter of which was fifteen feet and eight inches. If this tree had been hollowed out, and a round table put in the centre of it, a greater company than that of CALIGULA might have feasted in this vegetable dining-room. The elder MICHAUX measured another tree, which was forty feet four inches round at five feet from the ground; which latter tree became renowned from GENERAL WASHINGTON having measured it twenty years before. MICHAUX says that this tree is seen in the mixed woods with a trunk several feet in diameter at the height of sixty or seventy feet; and that it

begins to ramify near the summits of the general mass of trees. It is very well known, that the families of the SQUATTERS, or first settlers, frequently scoop out the trunks of these trees; and live in them as houses for years together. These surprisingly large trunks are sometimes fashioned into CANOES, and MICHAUX speaks of one of these, which was made to sail on the river WABASH, that was *sixty-five* feet long, and that would, of course, carry more than a hundred persons.

465. This is quite enough as to the size the tree is capable of attaining. The wood is used for all those purposes that the soft woods are generally applied to. It is frequently used, in America, in the making of bedsteads, and sometimes in the interior of the building of houses. It is used universally as butchers' blocks, and for all similar purposes, it being less inclined to split or chip away than blocks made of any other kind of wood. It is also used for blocks on board of ship; for, though it is rather too light, it has the excellent quality of not being prone to split or crack.

466. In England it will hardly ever be planted in woods merely for the sake of the timber; but for avenues, for clumps, for independent trees, in grounds of large space, it is one of the finest trees in the world. It is even more rich and shady in foliage than the ORIENTAL PLANE, and does not, like that, shed part of its leaves in the summer. It is preferable beyond all measure to ELMS; even its timber is better; it grows beyond measure faster; and its leaves retain their freshness during the whole of the summer, and it is never infested, as the ELM very frequently is, by those caterpillars which make it an object of ugliness instead of an object of beauty.

467. Having now given a description of the PLANE, I next proceed to give instructions as to the manner of raising it. It is curious that MILLER, while he says that he has raised PLANES from the seed, seems to place no reliance upon that method, but resorts to the *Cuttings* and the *Layers*; and thus it is, that they are raised, by all our gardeners and nurserymen; and thus it is, that we have no *Plane* trees in England, but many *branches* of trees. We scarcely ever see them going up with a clear straight trunk, to any considerable distance. The trunk is in fact a great limb of a tree, and it throws out branches after the manner of a limb; and never goes on rising straight upwards until it gets to a great height, and then begins to ramify. I have seen PLANES in America a great deal more than a hundred feet high, straight as gun-sticks, and with heads beginning to spread sixty or seventy feet from the ground. The reason is, that these trees come from the seed; but I am sure that the gardeners and nurserymen in England, who might raise them so much cheaper from seed than in any other way, do not know how to do it, or they never would resort to the tardy and expensive mode of raising them by cuttings or layers.

468. I imported enough of the seed of the OCCIDENTAL PLANE to furnish all England with trees; I sowed some every year, from 1822 to 1826 inclusive; and when I ought to have had hundreds of thousands every year, I got only a very few hundreds of plants. Last spring, the spring of 1827, I was resolved to take particular pains about the matter. I sold some of the seeds in my boxes of seeds; and, in a catalogue which accompanied the boxes, I directed the seeds to be sown upon sifted mould, and then to be covered with sifted mould only about an inch deep. This I did myself, sowing many beds in this way; and, to my

great mortification, I found that I had got, after all, only about *five or six hundred plants!* I gently moved the top of the ground in many places, saw that the seeds had struck, covered over the places again, making sure that, as there was a root already come, there would also come a plant. I waited, however, in vain; for though the leaves of the plants actually came out of the seed under the ground, only the very few that I have mentioned ever made their appearance above ground.

469. I here request the reader to turn back to the account of my experiments with regard to the Birch seed, which account the reader will find in paragraphs 158, 159, 160 and 161. Accident led me to perceive, or I think I may call it attentive observation, that BIRCH trees were to be obtained by sowing the seeds *upon* the ground. Why then, thought I, may it not be the same with regard to the seeds of the PLANE? The form and substance of the seed seemed to forbid the hope; but, nevertheless, Planes must come from the seeds dropped on the ground in America, and I resolved to try the thing at any rate.

470. The SEED of the PLANE comes in a round ball, as nearly as possible an inch in diameter, through the centre. The seed itself is in the form of a *round nail* without a head, tapering from the hammer end to the point; it is about two thirds of an inch long; the point of it has a parcel of stuff like cotton wool attached to it, and this is packed round a little hard ball in the centre of the large ball. The seeds are so formed that the points of all of them go into and are attached to a part of this wool, while their big ends, pressed close together, form the circumference of the ball. When the ball is ripe and dry, it tumbles to pieces, or, falling from the tree, each seed finds a wing

in its portion of wool, and is thus scattered abroad by the winds.

471. The seed, as I have called it above, is, however, only the coat of the seed. It is a little brown thing, in the shape of such nail as I have described before. There is nothing of vegetation that appears in it; but, if carefully opened, after having been for a while steeped in warm water, you can discover a little point of white *pith;* but even then, after the soaking, *not exceeding in bulk the point of a common pin;* beyond all measure smaller than the pith of a Lettuce seed. From this comes, from this mere atom comes, such immense trees! This is a more wonderful thing than all the other wonders of the vegetable creation.

472. Now, the reader will perceive, that this atom of *pith* is not of sufficient strength to *force up out of the ground* the thick and tough covering which nature has put around it. The manner of growing in seeds is, the root starts first, and, when it has acquired sufficient strength, it forces up the head. The root of the Plane comes out at the point of the nail, as I have called it; but this root has not sufficient strength to force up, through any thing of a covering of ground, so comparatively large and long a thing as the shank and butt of the nail. When covered with ground, therefore, the root starts, the leaves come out under the ground, but without the means of being forced up out of the ground; and this is, too, the case of the Birch and of many other seeds.

473. I, therefore, as the result of these reflections and observations, went to work, and proceeded thus: I broke the Plane balls to pieces, rubbed them well with the hand to separate the wool from the seeds; sifted out the seeds as

you would grain from chaff; put the seeds soaking in luke-warm water for eight-and-forty hours; took the seeds out of the water, and mixed them with finely-sifted fresh earth, ten gallons of earth to one gallon of seeds; put the mixture upon a smooth place upon the bare ground; turned and re-mixed the heap every day, for four or five days, keeping it covered with a mat whenever the turning and mixing was not going on; and, as soon as I perceived here and there a root beginning to appear, I sowed the seeds upon a bed of sifted earth, mixed with the sifted mould just as they came out of the heap.

474. There the seeds lay then, pretty nearly as thick as they could well lay, on the top of the ground. In this state I watered them gently every evening with a fine-rosed watering pot, kept them securely shaded from the sun by mats, by the means of frames or hoops to keep the mats from touching the ground, and took the mats off every evening at about an hour after sun-set. In about a week, I saw the roots coming out at the point of the nail, and going down into the ground. Soon afterwards, the nails, as I call them, began to raise their heads. In a few days they were all standing bolt upright, and in a few days more, the rusty looking coat was shuffled off, and out came the seed leaves, resembling, as nearly as possible, the seed leaves of the Red Beet-root, or those of the Mangel Wurzel.

475. After this, I shaded the plants less and less, till they became hardy enough to be exposed during the whole of the day. Instead of being done in April, this work was not done until the month of July; and therefore the plants were a mere nothing in point of size in the month of October; and were hardly in a condition to resist the frost without some degree of covering. I am now about to plant them

out, and they will, I dare say, be very fine plants by the next fall. In this manner they will stand in the seed-bed, at less than an inch apart. A small space will give you thousands and thousands of plants, at the expense of a very few shillings.

476. As to the treatment of the plants after the seed-bed, they should be put into a nursery in the manner directed for the ASH. They have excellent roots, move without risk, strike off at once; and if, by early frosts or some other accident, the leading shoot be injured, you have only to cut off the injured part, down to the first live bud you come to: another leader comes immediately; the little crook that is made by the change of the leader is completely grown out the first year, and the tree grows up as straight as a rush. These trees might stand one year or even two in the nursery, before being finally planted out; but they should not stand longer, if you mean to have straight and beautiful trees. Whether planted in clumps or in single trees, there must be an *effectual fence* extending in such a way as to be at five feet distance from the trunk of the tree in every direction. It is little short of a mark of idiocy to plant trees, and especially trees for ornament, and then to turn cattle in to eat them! Yet, how often is this done! The ground ought to be kept clean until the tree attains a good height. If you plant large trees, they must and they will be *leaning* trees. The wind will make them take a leaning posture, before the root be sufficiently powerful to cause them to stand in an erect attitude. The roots of trees are their foundations, their buttresses, their spurs; and if these do not come until after the tree begins to lean on one side, they will indeed prevent it from falling, as an old wall is prevented from falling by buttresses placed against it; but, as these will never make the wall to stand upright, so the

roots of a tree will never restore it to its erect attitude, if it once begin to lean.

477. The Plane should, like most other deciduous trees, be cut down to the ground the year after it is planted out; it will then send up a surprisingly strong shoot; and the trunk will go on in a manner as straight as a gun-stick. As it goes on rising, the lower side-shoots should be taken off, always cutting close with a sharp knife, until you have got a clear trunk to the length that you desire.

THE POPLAR.

In Latin, *Populus;* in French, *Peuplier.*

478. The Botanical characters are :—The male and female flowers grow upon separate trees. The male flowers or katkins have one oblong, loose, cylindrical empalement, which is imbricated. Under each scale, which is oblong, plain, and cut on the border, is situated a single flower without any petal, having a nectarium of one leaf, turbinated at the bottom, and tubulus at the top, and eight stamina terminated by large four-cornered summits. The female flowers are in katkins, like the male, but have no stamina; they have an oval, acute-pointed germen, with scarcely any style, crowned by a four-pointed stigma. The germen becomes afterwards an oval capsule, with two cells, including many oval seeds having hairy down.

479. This is a very numerous, and, according to my taste, is, for the most part, a very worthless family of trees. They all bear a seed in katkins, which come out early in the spring, and the seed contained in which is ripe when the katkins fall, which is generally late in May, or the beginning of June. All the sorts may be raised from cuttings. A cutting, or truncheon, stuck into the ground, produces

the tree; and, in general, a very ugly tree it is; but it grows fast, yields a great deal of stuff to make rough boards of, outgrows a Fir beyond all comparison, and makes good stuff for packing-cases, and other things for which pasteboard is a little too weak.

480. The sorts that we have in England, are the Abele Tree (*Populus Alba*); the Aspen (*Populus Tremula*); the Black Poplar (*Populus Nigra*); and that well-known great, staring, ugly thing, called the Lombardy Poplar, which, to all its other amiable qualities, is very apt to furnish its neighbours with a surplus population of caterpillar and other abominable insects. The first of these, the Abele, is, however, a really fine tree, grows to a great size and great height, especially near running water, and produces timber, by no means to be despised. The wood takes a fine polish, it is close-grained, though light; and is, take it altogether, and considering all its uses, far preferable to the wood of the Elm; but I have never seen it of any considerable size, except in rich land, or very near to running water.

481. The largest I ever saw, and the loftiest also, stands opposite to a fine farm-house, near the Thames, on the road from Hampton to Chertsey Bridge. The leaves of this tree are white on the under side, and give the tree a white appearance when blown up by the wind. The trunk, also, is of a whitish hue, speckled with black. This tree throws up abundance of suckers. If standing where the suckers are mowed off by the scythe at hay-cutting time, it will send up a new crop for the next year. Hence, this fine tree is always raised from *suckers*. Like parent like child, and the young trees send out suckers, and infest the whole neighbourhood with them, by the time they attain the

height of ten or twenty feet. These suckers are put into nurseries when they are small, stand there till they are large; and then, when planted out, are sure to lean on one side.

482. The Aspen has a little round leaf that is continually in motion when there is a breath of wind. The wood of this tree is certainly good for as little as any wood can well be. It is found in almost all our coppices; and it continues to be found there, because people do not take the pains to root it out. I never heard of any man that ever thought of raising, or that ever wished to have, an Aspen tree. If there should happen to be such a man, he may be gratified at any time, by cutting off a truncheon in February, of about two or three feet long, and sticking one-half of it into the ground. The tree will come from this simple operation, and this is a great deal more pains than it is worth.

483. The Black Poplar, or, as it is more frequently called, the Black Italian Poplar, is a surprising thing for quickness of growth. It is almost incredible, the size to which a tree of this sort will attain in good ground in the course of fifteen or twenty years. I planted some of these trees in the plantation mentioned in paragraph 350. They were, when planted, of about the same height of the rest of the trees; but, at the end of seven or eight years, they were so lofty and so big, that the plantation looked like here and there an old tree, with a parcel of little ones planted round it. They were twice as big, and half as high again, even as the Locusts. Thus situated, they were a great dissight to the plantation, and I cut them down, and tore up the roots, to put a stop to their breeding of suckers. At the same time, I thinned out the Locusts, had the

brush of both cut off and carried away; but the trunks were laid down in the plantation, and, from some cause which I now do not recollect, they remained there until the next winter, when I had them taken away. The men, as they brought the trunks out of the plantation, threw them down upon the adjoining grass ground, and one of the Poplars, pretty nearly as big round as my thigh, at the butt, snapped short asunder. I had planted the trees in consequence of the high encomiums passed on this sort of Poplar by Mr. Pontey, in his book on "*Profitable Planting.*" The snapping asunder of this trunk was quite enough for me. I instantly cut down and grubbed up every tree of the kind that I had upon my premises. I examined the rest of the trunks, and found them all very little better than touchwood. Nevertheless, this is a monstrous producer of boards for packing cases, or for any other temporary uses where durability is not required. The form of the trunk is spiral, and the tree throws out no very large limbs; but it produces wood in the trunk faster than any other tree that I have ever seen.

484. This tree throws out suckers, but not so numerously as the Abele. It is generally raised by the means of cuttings, about as big as your finger and a yard long, which are put into the ground in the month of February to the depth of half their length. They will send up shoots the first year, only one of the stoutest of which shoots, should be left. Thus will come a tree, which ought to be planted out in the same manner as directed for the Ash.

485. As to the Lombardy Poplar, it is so utterly worthless, so ugly, and so filthy, that I cannot bring myself to say any thing about it, except that it may be raised by

either truncheons or cuttings, in the manner before pointed out.

486. Of the American Poplars, there are ten sorts:—the Carolinian Poplar (*Populus Angulata*); the Cotton Wood (*Populus Canadensis*); the Black Poplar (*Populus Hudsonica*); the Virginian Poplar (*Populus Molinifera*); the Cotton Tree (*Populus Hargentea*); the Balsam Poplar (*Populus Balsamifera*), or Tacamahaca Tree; the Hearl-leaved Poplar (*Populus Candicans*). Besides these, there are the American White Poplar (*Populus Canescens*); the American Aspen (*Populus Tremuloides*); and the American Large Aspen (*Populus Grandidenta*).

487. Like the English Poplars, the wood of all these is good for very little; and can be very seldom used in a country where excellent sorts of timber are so numerous and so abundant. Cuttings and truncheons, even if we had a mind to raise the trees, could not be brought from America. They may be all raised in that manner; and if any body has a mind to possess this American collection, the seed might be easily brought over.

488. Now, if it were desirable to have very fine and beautiful Poplar trees, why not raise them from the seed? One complaint against the Poplar Trees, is, that they drop their katkins in such abundance, that they litter the ground all about, and make the neighbouring lawns and walks so very unsightly. These katkins are full of little oblong seeds covered with a soft down. I never sowed any of them; but, I am sure that the trees may be raised easily from the seeds. I do not know that the seed would send the plant up, from under ground, because the kernel, in

proportion to its size, is very much loaded with its wool and its shell; and, therefore, it might act like the kernel of the Plane, vegetate under the ground, and never send up a plant; but, I am very sure, that the plants may be raised from seed, by sowing the seed in the same manner as that which I have, on my own experience, recommended to be practised in the case of the Plane.

SASSAFRAS.

In Latin *Laurus Sassafras;* in French *Sassafras.*

489. The botanical characters are:—It has male and hermaphrodite flowers on different plants; the male flowers have no empalements; they have one petal, which is cut into six segments at the top, and nine stamina which are shorter than the petal, standing by threes, terminated by slender summits. The hermaphrodite flowers have no empalements; they have one petal, which is slightly cut into six segments at the top. In the bottom is situated an oval germen supporting a single style of the same length with the petal, crowned by an obtuse stigma, attended by six or eight stamina: there are two globular glands, standing upon very short foot stalks fixed to the basis of the petal. The germen afterwards becomes an oval berry with one cell, enclosing one seed of the same form.

490. This is called by the botanists a Laurel; and the reader might be apt to suppose it to be an evergreen, which it is not. I am writing about trees and underwoods of utility, and not of mere ornament; but if there be both comprised in the same tree, it being greatly ornamental, certainly does not lessen its utility any more than the beauty of a maid servant lessens the utility of the activity, cleanliness, skill, civility, and excellent good humour, with which that description of persons generally perform their various and very necessary functions. The use of the Sassafras is to

be found in its *bark*, and particularly in the *bark of its roots*, which has now been in general use all over Europe, amongst the practisers of the healing art, for upwards of two hundred years. For myself, I must say, that I have had no experience of its utility; but others have, or think they have, which, in such a case, is pretty nearly as good.

491. Bark, wood, leaf, seed, flower, all have a pretty strong, and by no means a disagreeable, odour; and one never would imagine that it was *medicine*, if one did not so often hear it talked of as an excellent sudorific. The Americans gather the flowers in the spring, and carry them to the great cities, where the *overcharged speculators* stand in need of stomachics, and, for various weighty reasons, of something to purify the blood; and, if the Sassafras would but purify the morals at the same time, it ought to be cultivated *liberally* in every mercantile and manufacturing town of the *mother* as well as of the *daughter* country. The farming people, taking compassion on the overgorged citizens, and not, doubtless, from any desire to drain their purses while they are purifying their blood, gather the flower in the month of May, in Long Island for instance, carry them down to New York in great quantities, and there charge for them only the very moderate price of four English pence a pint; when any long Yankee, assisted by a little bit of a ladder, would easily gather twenty bushels a day! Yet you see the "*Yorkers*" running to the market with all possible eagerness to obtain this means of restoring or preserving their health, never imagining that they would stand in no need of Sassafras tea, if they would but abstain a little from their breakfasts of beef-steaks, and their glasses of grog from morning to night.

492. The farmers, in many places, boil the young shoots in water, to which they add some treacle, and which, when it has stood some time to ferment, they call "*beer*," and drink it as such (alternately with their grog) during the whole of the summer. MICHAUX says, that the dried leaves and the young branches of the SASSAFRAS contain a mucilaginous principle; and that, "in LOUISIANA, the leaves are "used by the inhabitants to thicken and to give a high "relish to their *pottage*."

493. Such are the medical, the culinary, and domestic uses of this tree; but, in this country, it will scarcely ever be planted with a view to profit, except for the sake of its *bark*, though its wood is not an inferior one by any means. A proof of its being pretty good is, that it is frequently used for the making of posts in farm fences; sometimes for joists and rafters; more frequently still for bedsteads, which, on account of its odour, perhaps, are known to be never infected with "insects," as MICHAUX, having contracted the habit of American delicacy, calls fleas, bugs, and lice. But here would arise a difficulty, namely, what are to become of the "*insects*" if the body happen to take them into the bed. An excellent cleanser of the body the bedstead might be; but then the "insects" must be absolutely compelled to beat a march, and would then distribute themselves all over the house.

494. The bark is the thing for which we must look at this tree as an article of profit. Very large quantities of it are brought into all the countries of Europe, and to this country amongst the rest. Sometimes it is imported in the shape of oil or extract; and there are manufactories in America for the purpose of obtaining these from the bark.

I remember seeing one, in New Jersey, with not less, I am sure, than five hundred wagon loads of the exhausted bark lying in the neighbourhood of the building. Our Custom-tariff shows that we import a great deal; and, if it can be produced here, out of our own land, no political economist that ever crossed the Tweed shall make me believe that it would not be better for us to do this, than to send English manufactures, paid for in great part out of the poor-rates, to be exchanged for this article in America.

495. After all, however, with me the great recommendation is, the singular beauty of the tree. It sometimes, in good land, attains the height of forty or fifty feet, but it does not grow very fast after the first six or seven years; and, therefore, as timber, it is excelled by so many other trees, and, as underwood, it being good for nothing, the Sassafras cannot be spoken of as a tenant of woods or coppices, but, for *hedge rows*, it would be excellent. It is hardy in the extreme; it will thrive on the most arid soil. It is seen in company with that hardiest of trees, the Red Cedar; it sends out suckers like an Elder. When once there is a stem of it in a hedge row, you are sure to have it there in abundance, until you clearly grub up the whole row.

496. Then, as to the beauty of the tree, I scarcely know one that surpasses it. The leaf is, in substance, that of the Common Laurel; but, in colour, more bright and pleasing to the eye; and, as to the shape of the leaf, the leaves have various shapes upon the same tree; some oblong, others much broader than long, and having one, two, three, or four deep openings in their sides, full half as deep as the openings between the fingers of a man's hand. The tree

comes into bloom very early in the spring, and is covered all over with large bunches of yellow flowers, each flower rather insignificant in itself, but the whole making a very gay show. In the fall of the year, in the month of October in Long Island, the seeds become ripe; they stand upon stalks of a red colour, at the end of which there are red cups, very much in the form of an ale-glass, and into the cups the small end of the berry, which is precisely of the shape of a hen's egg, and which is of a deep purple colour; into this red cup, of the shape of an ale-glass, the small end of the purple egg just enters, and is apparently there held by nothing. The tree, at this season, is still more beautiful than in the spring, if you come near it; for, though it is generally loaded with seeds, these cannot be seen from a distance, like the flowers, which come out in the spring, while the leaves are very young and small. As soon as the berries become purple, they are ripe; and, as soon as they are ripe, they are, if you wait one single day too long, devoured by the birds.

497. It is very singular that so beautiful a tree should have so long continued to be so rare in England as it is. I never saw but two in England, one in Kew Gardens, and the other in a little garden which, when I saw it, belonged to the Dowager Lady Lonsdale, near the Banks of the Thames, in Fulham Parish. I first saw this tree about twenty years ago. I saw it again about five years back, and it was grown very much. After my return from America, in 1819, I asked a nurseryman how he sold young Sassafras plants? He told me that he had none, and that such a thing was not to be had under a guinea, or half-a-guinea at the least. I asked him why he did not import the seed from America? and he told me that that was of no use, for that it could not be made to grow; but that he

should like to get some of the plants. The truth is, that the few that there are in England (except those that I have raised from the seed) have been raised from suckers, coming from plants, originally brought from America. It was difficult to make me believe, that the seed would not grow in England; and, therefore, as soon as I got some land, I began to import the seed; and, I sowed it, of course, but for years I never got any plants.

498. This seed is a most curious thing. It has a pulp on the outside, within that pulp a thin shell, within that shell a plump fleshy kernel very large in proportion to the whole bulk of the berry. I, for want of looking into Miller, expected such soft seeds to come up the first summer after they were sown; and never seeing them come up, I, year after year, dug up the ground and sowed it with something else. Miller would have told me, that the seeds lie two years in the ground, and sometimes three years; in short, he would have told me all that I now know; for, in the spring of the year 1826 I sowed several small beds of these seeds. I resolved not to break them up the first year; and last spring, they came up tolerably well; and I have sold several hundreds of them this winter. Nurserymen have generally a strange aversion to the raising of trees from seeds; and it appears that this aversion is hereditary, going down from father to son, and from master to apprentice; for Miller, after teaching the mode of raising the trees from seeds, immediately tells us, that the general practice is to raise them from *layers*, which is *very seldom attended with success;* and that, says he, is the reason, why this tree is so very rare in England. The truth is, Miller's book was too large: there was too much of it for a gentleman to read; and as to gardeners, they were, in his time, as they are in these times, much too wise, and of a great deal

too much experience, to suffer themselves to be directed by books.

499. One whole year therefore, you must wait for the seed coming up; that is to say, if you sow it this spring, you must wait till next spring before you can see the plants come above ground; and sometimes you must wait even another year in addition, soft as the seed is when it goes into the ground. There is doubtless something in the oil, or some other matter that is about it, which requires that length of time, to subdue its powers of preventing vegetation.

500. The young plants will attain the height of from five to seven inches the first summer; and then, early in the month of November, they ought to be removed, with all possible care, into a nursery, the ground of which ought to be very good and made very fine, the manner of removal being the same as that directed for the ASH in paragraphs 120, 121 and 122. In this nursery these plants ought to stand two or three years. If they lose their points in the seed-bed, as they are apt to do if there be sharp *early* frosts, you must cut the point back to the first live bud, and then the tree will shoot up again. They will not make much progress the first year; for the wood is hard, and the plant of slow growth, while very young; but, when once it gets to be two or three feet high, it pushes on at a fair rate.

501. Having stood in the nursery two or three years, the plants ought to be put in the spot where they are finally to grow. Great care must be taken in the removal; but if the work be well done, the plants are sure to grow. When the plants have stood two years, they may safely be cut down if you choose; and then, they will send up a shoot of two

or three feet long the first year. If you wish to have the tree lofty, you must keep the lower side-shoots pruned off, in the manner directed for other deciduous trees, always cutting with a sharp knife and close to the trunk. If you plant in hedge-rows, or in shrubberies, and do not want the tree to attain any considerable height, the best way would be to cut off, within a foot or a foot and a half of the ground, this will bring out two or three stout shoots, these will become limbs in time, and you will have a low tree with a wide spreading head.

502. When once the tree gets to be as big as your arm at the butt, it will begin to throw out suckers, especially if the lateral roots should be cut or torn by the plough or spade. These suckers, if they come up in the hedge-rows, may stand till they throw out suckers again; and they will soon spread along a hedge-row of several hundred yards in length, yielding an immense quantity of that *salubrious* bark, the nature of which is so precious as to cause it to be imported, and to be purchased and consumed, though loaded with a heavy duty.

503. Now, our hedge-rows are generally filled with all sorts of rubbish; Maple, Elm Stumps, Scrubby Oak Stumps, Elder Stumps, Brambles, Knee-holm, and various other good-for-nothing things, which are, at the same time, as unsightly as they are worthless. Any where near a good house, the Sassafras would make beautiful Hedge Rows. In clumps, in independent trees, upon lawns, in shrubberies, they would be singularly ornamental; covered with blossoms very early in the spring (not later than the 20th March); loaded with fine bright leaves all the summer, which leaves die in the fall of the brightest yellow colour; this tree, uniting all these qualities, would, if it

were to become common, be really an ornament to the country; and common it may be, if people will take the pains to send for the seed. I have sold the trees this year for a shilling a-piece; next year, if I have good luck, I dare say I shall sell them for twenty or thirty shillings a hundred; and, if I keep on my nursery affair, I should not wonder if I were to sell them the year after, for ten or fifteen shillings a hundred; in the mean while, I am now about to sell some of the *seed;* and therefore, other people may raise them if they will, at the rate perhaps of five for a penny.

THE THORN (BLACK).

In Latin, *Prunus Sylvestris.*

504. The botanical characters are:—The flower has a bell-shaped empalement of one leaf, cut into five parts; it has five large roundish petals which spread open, and are inserted in the empalement; and from twenty to thirty stamina which are nearly as long as the petals, and are also inserted in the empalement, terminated by twin summits. It has a roundish Germen supporting a slender style crowned by an orbicular stigma. The Germen afterwards turns to a roundish fruit, enclosing a nut of the same form.

505. The tree, or rather the bush, on the subject of which I am now about to hope for the reader's attention, is pretty well known to most English people, who will generally, perhaps, look upon it as something of little importance; but which is of real importance as to the two great purposes to which it is applied; namely, the making of excellent *hedges,* and the making of excellent *Port wine:* in which last of its functions I shall consider it first.

506. Every one knows that this is a THORN of the Plum kind; that it bears very small black plums, which are called Sloes, which have served love-song poets, in all ages, with a simile whereby to describe the eyes of their beauties, as the snow has constantly served them with the means of attempting to do something like justice to the colour of their skins and the purity of their minds, and as the rose, has served to assist them in a description of the colour of their cheeks.

507. These beauty-describing sloes, have a little plum-like pulp, which covers a little roundish stone, pretty nearly as hard as iron, with a small kernel in the inside of it. This pulp, which I have eaten many times when I was a boy until my tongue clove to the roof of my mouth and my lips were pretty nearly glued together, is astringent beyond the powers of alum. The juice expressed from this pulp, is of a greenish black, and, mixed with water, in which a due proportion of logwood has been steeped, receiving, in addition, a sufficient proportion of cheap French brandy, makes the finest Port wine in the world, makes the whiskered bucks, while they are picking their teeth after dinner, smack their lips, observing that the wine is beautifully rough, and that they like "*a dry wine* that has a good '*body*.'"

508. It is not, however, as a *fruit-tree* that I am here about to speak seriously to sensible people: it is of a *bush*, excellent for the making of *hedges*, and not less excellent for the making of walking sticks and swingles of flails. The BLACK THORN blows very early in the spring. It is a Plum, and it blows at the same time, or a very little earlier, than the Plums. It is a remarkable fact, that there is always, that is every year of our lives, a spell of cold and

angry weather, just at the time that this hardy little tree is in bloom. The country people call it the *Black Thorn winter;* and thus it has been called, I dare say, by all the inhabitants of this island, from generation to generation, for a thousand years.

509. This Thorn is as hardy as the WHITE THORN; its thorns are sharper and longer; it grows as fast; its wood is a great deal harder and more tough; it throws out a great deal more in side-shoots; and it is, in every respect, better than the HAWTHORN for the making of a Hedge. If I be asked, how it has happened, then, that the HAWTHORN is constantly used for this purpose, and the BLACK THORN never, or scarcely ever, I answer, that the reason is very clear; namely, that a sack of the seed of the HAWTHORN may, almost anywhere, be got for a shilling or half a crown at the most; and that, to get a number of BLACK THORN sloes, equal in number to the HAWTHORN berries contained in a sack, would, in almost any part of the kingdom, cost five, ten, nay twenty pounds.

510. The sloe is very large compared with the size of the HAWTHORN berry; you must get six sacks perhaps of the sloes to have a number equal to the berries contained in one sack; and six sacks of sloes, except in very woody countries, would not be found perhaps in the half of a whole county. The tree, like other plums, is liable to blight. It seldom bears any considerable crop, and very frequently bears no fruit at all. It grows no where except in hedge-rows and coppices: in the former it is too much exposed to bear much fruit; and in the latter, it is too much in the shade to bear any fruit at all. Hence it is, that, though all of us who have been born and bred in the country know that the BLACK THORN is by far the best of

the two, we never heard of such a thing as the planting of a Black Thorn Hedge.

511. As *bushes*, for the making of hedges, the Black Thorn is always carefully laid by when hedge-rows and coppices are cut. These bushes will lay longer in a dead hedge without perishing than any other sort of stuff of which dead hedges are made. This Thorn will thrive, and that vigorously too, in the very poorest of land. It sends up straighter shoots from the stem than the White Thorn does, and these shoots send out, from their very bottom, numerous and vigorous side-shoots, all armed with sharp thorns. The knots produced by these side-shoots are so thickly set, that, when the shoot is cut, whether it be little or big, it makes the most beautiful of all walking or riding sticks. The bark, which is precisely of the colour of the Horse Chesnut fruit, and as smooth and as bright, needs no polish; and, ornamented by the numerous knots, the stick is the very prettiest that can be conceived. Little do the bucks, when they are drinking Port wine (good old rough Port), imagine, that, by possibility, the beautiful stick with which they are tapping the sole of their boot, while admiring their legs; never does their philosophy carry them so far as to lead them to reflect, that, by possibility, for the "fine old Port," which has caused them so much pleasure, they are indebted to the very stick with which they are caressing their admired Wellington boots!

512. In some situations, it would not be difficult to obtain Black Thorn seed enough to plant a hedge of considerable length; and, at any rate, it may be done if any one will take the pains; and, therefore, I shall now proceed to state the manner of raising the plants. The seeds are not properly ripe until pretty late in the month of October,

They may be suffered to hang till they are dead ripe, provided the boys do not find them out; for though, as we have seen, excellent in the making of Port wine, they are rather too astringent, too "rough," for the birds, whose tastes seem to differ from the lovers of "*Good Old Port.*" When *ripe*, they should be gathered; mixed with dampish sand, kept turned in a cellar or a shed, until the month of February, and then sowed in beds in the manner directed in the case of the Ash.

513. Like the seed of the Plum, that of the Black Thorn comes up the first year; that is to say, if not sowed too late, and if kept in moist sand or earth until the time of sowing; and without these precautions, Plum-stones will lie a whole year before they begin to sprout, as Peach and Apricot stones will. If managed in the manner that I have here directed, the Black Thorn plants will be up in the month of May, and in the month of October afterwards, they will be from five to eight inches high. In the month of November, or in the next month of March, they ought to be removed into a nursery, being assorted and planted in the manner directed for the Hawthorn, paragraph 275; and as to the manner of putting them into hedges; as to the age of the plants for this work, as to the season, and every thing else relating to it; the reader will first turn to paragraph 276, and after that to paragraphs 34 to 37 inclusive.

514. As an ornamental shrub, or little tree, the Black Thorn is by no means equal in beauty to the Hawthorn; neither the shape nor colour of the leaf is equal to that of the White *Thorn* nor is the leaf nearly so abundant; in proportion to the size of the tree. But, the Black Thorn comes into bloom a full month, if not six weeks, before the Hawthorn; and it makes a very gay show, when scarcely

any blossoms have appeared, or any tree is in leaf. Clumps of Black Thorns, therefore, or independent plants of this kind, might be placed very advantageously in parks and lawns; and, if managed well, even in shrubberies; for they are in bloom much earlier than any other shrub. The plant has so many advantages over the Hawthorn, that it is impossible that it should not be cultivated, in many cases, in preference to the Hawthorn, were it not for the great difficulty of obtaining the seed in any considerable quantity.

THE TULIP TREE.

In Latin *Liriodendrum;* in French *Tulipier.*

515. The botanical characters are :—The proper involucrum of the flower is composed of two angular leaves, which fall off; the empalement is composed of three oblong plane leaves, like petals, which fall away. The flower is nearly of the bell-shape, and has six petals, which are obtuse, and channelled at their base; the three outer fall off; it has a great number of narrow stamina, which are inserted to the receptacle of the flower, having long narrow summits fastened to their side, and many germen disposed in a cone, having no style, crowned by a single globular stigma. The germen afterwards becomes scaly seeds, lying over each other, like the scales of fish, and form the resemblance of a cone.

516. There is but *one* species of Tulip Tree; but that *one,* as the lioness said of her Cub, is a tree indeed. This tree, as an ornamental piece of vegetation, is certainly one of the finest in the world. The leaf is so large, formed with such singular elegance, is of so beautiful a green, preserves its freshness so admirably, dies of so delicate a colour, and is in such ample quantity on the tree; the flower, though not

beautiful as a flower, is so large, is in form so elegant, comes in such quantities, and invites the eye to so great a height; the trunk of the tree is so straight, the limbs so evenly balanced upon it, their distribution is so regular, and, in short, the whole tree is so magnificent an object, that it is impossible for any one who has a taste for rural affairs not to desire to see this tree extensively planted in England.

517. But, great as its merits are as an ornament even to the grandest of mansions and domains, its ornamental qualities are nothing compared with those which are presented to us in its divers qualities of utility. This tree delights in a light and moist soil. I have always seen it finest in little flats near to rivers or brooks. In such places it grows a great deal higher than in high or dry lands; but it does not want rich lands, and there are numerous little valleys and dells, in divers parts even of Bagshot-heath, where the water comes oozing out of the sides of the hills, and makes a sort of little swamp, and marshes, in which this tree, with a little draining of the swamp, and a good trenching of the land, would flourish exceedingly. But, in every Gentleman's estate of any considerable extent, there are more or less of rivulets of various widths; and, on the sides of these rivulets, there are always frequently occurring, little flat parts, covered in flood times by the water; and of course, very moist all the summer. In such places, and on the sides of rivulets and ditches in meadows, the Tulip Tree would flourish exceedingly. It does not like ground where the bottom is *constantly* water; but where it is occasionally wet. Such a situation, however, is not absolutely necessary, for I have seen very fine Tulip Trees, from seventy to ninety feet high, growing on the side of a hill amongst rocks. In short, there is hardly any ground

where it will not attain a pretty good size; but the situations I have pointed out are the best.

518. The height of this tree, when it arrives at perfection, may be taken, upon an average, at a hundred feet. Michaux saw one which he judged to be one hundred and forty feet high; and his son, who is now living at Paris, and who imports American tree seeds into France, afterwards verified the correctness of the estimate. Michaux measured this tree and found it twenty-two feet and a half in circumference, at five feet from the ground; that is to say, about seven feet three inches through. A plank might, I dare say, have been cut out of this tree, fifty feet in length and four feet in breadth at the smallest end. My correspondent sent me some Tulip-tree planks last year, one of which was fourteen feet long, and very nearly four feet wide at both ends; though these planks were not selected for their great dimensions, but were merely planks such as he promiscuously found in the timber-yards of New York, and sent to me as a sort of venture to see how they would sell. I sold the greater part, and kept the rest for my own use. In the whole lot, forty-seven planks, there was not to be seen a single knot, curl, or flaw.

519. The wood, which is nearly of a *Lemon* colour, is made use of in America for various purposes, where lightness, fine grain, and high polish, are all wanted. It is made use of particularly for coach-pannels, for which purpose it is carried from the Northern to the Southern parts of the United States. It makes beautiful bedsteads, butter churns, cheese vats, wooden bowls (of which I have one that will hold more than a bushel). The farmers choose it for eating and drinking troughs for cattle, which troughs are cut out of a solid piece with a chisel. The wood receives a polish

equal to that of any wood; and I am told that a cabin of a small packet, which goes on the Thames, from Westminster Bridge upwards, made of this wood, sold by me to the proprietor of the packet, is deemed the most beautiful thing of the kind, that ever was seen, by those who have had an opportunity of seeing it. The colour of the wood appears to me, to be about half way between a lemon colour and a white. I have used some of it in making shelves for a dairy and dressers for a kitchen; and, though not at all polished, I have never seen any thing of the kind so handsome.

520. I should suppose, that this wood might be obtained at as little expense as that of any of the Poplars; it might be a little longer in coming to perfection; that is to say, in arriving at a size sufficient for large plank; but a plank of it must be worth twenty planks of Poplar of the same size, if not a hundred planks. It is a tree that grows very fast, and when raised from the seed goes erect, and does not send out limbs to any very great extent until it becomes nearly as lofty as the Plane. Generally speaking, it is not so large and lofty a tree as the PLANE; but, flowers included, it certainly surpasses even that majestic tree in elegance and beauty. We have in England nothing but very imperfect specimens of this tree, though it has been known in England for pretty nearly a hundred years, and though there is scarcely any fine gentleman's seat in the kingdom on some part of which the tree is not to be found. MILLER speaks of raising the trees from the seed, and says that he did it by means of artificial heat. But we gather from him, that raising from the seed was never practised to any considerable extent, and that the practice of raising from *layers* was, even in his day, the general practice. In order to have these layers, there must first be a tree grow-

ing in the nursery. The tree being cut down nearly to the ground, sends out numerous shoots from the bottom. When these grow up to eight, ten or twelve feet high, they are pulled down, a chop is given to each, pretty near to the stump, and that enables you to lay the whole branch or bough upon the ground, to which it is firmly fastened by a peg, having a hook at the top of it. Then the little side-shoots of this branch are pinned down singly by smaller pegs, each shoot receiving a little cut towards the butt of it, pretty much in the manner that the cut is given to the layers of Carnations; then all the butts of these side-shoots are covered over with earth; and, being kept moist by watering or otherwise in the summer, they, in the course of a couple or three years, get roots. They are then cut off from the main shoot, one by one, trimmed up, and planted in a nursery, where they are, I suppose, cut down the next year, in order to obtain a straight shoot, which is to serve as a trunk.

521. Every reader must at once perceive that a *tree* never can be obtained in this manner. It is a *branch* of a tree, and a branch of a tree it must remain, until it be *big enough* to be called a *limb;* and then, like every big limb, it will be continually throwing out side-shoots, to form limbs of a secondary size. A fair and straight trunk never does and never can come from it; and, of course, large and clear and beautiful plank never can be produced in this way. Therefore, to have the trees worth having, they must be raised from the seed; and that seed must be obtained from America; for I have no idea that it ever can ripen under an English sun. It is, however, very easily obtained, very light for conveyance, very conveniently preserved, and attended with very little inconvenience in the sowing or the managing.

522. When the petals of the flower drop, they leave behind them a little sort of cone, coming out of the middle of the stem of the flower. This cone gets at last to be about two inches long, and about three quarters or an inch through. It is composed of scales, which are perfectly dry in the fall of the year, and easily rubbed to pieces by the hand. One of these scales very much resembles, in shape, the tongue of an ox, with a small part of the root remaining attached to the tongue. This scale is like a piece of thin, dead bark; but, down nearly close to the root of it, there are two little cavities, in each of which, when the seed is good and well ripened, there is a little flat and oblong seed about half the size of the pith of a common oat. These seeds are covered by a very thick coat; and it is so difficult to get them out of the scale, that it is necessary to sow scale and all, without making an attempt to get at the naked seeds.

523. The manner of sowing the seeds is precisely that pointed out for the sowing of the ASH, for which see from paragraph 108 to paragraph 112, both inclusive. In that part of the work, I have been very circumstantial and minute relative to the manner of sowing; and I was so, for the purpose of saving myself the trouble of repetition, as well as for that of preventing the book from extending to an unnecessary bulk. But, as to the *season* of sowing, that must depend upon circumstances. The SEED must always arrive from America some time in the winter. If sowed in the spring, and in April, or even in May, which I think is best, the plants will not come up until the month of May of the succeeding year; but then all of them will come up that will ever come at all. If you were to keep the seeds out of ground during the whole of the summer, and sow them in the month of October or November, a part would

come up the next spring; but it would be only a part. Therefore, the best way is to sow them in April or May, when you can do it, with very fine earth, and in the completest manner.

524. Though the seeds will not come up during the summer, you must be very careful to keep the beds perfectly free from weeds; for, if weeds were suffered to cover them, they would deprive the seeds of all moisture. The weeds must be taken out as soon as they appear, because, if suffered to grow large, the pulling of them up makes great holes, disturbs the ground to a considerable depth, and, of course, tears up, exposes to the sun and wind, and destroys the seeds. These directions are very necessary to be given, and to be impressed upon the reader; because we are very much prone to suffer to lie neglected, that portion of our ground which we know will bring us nothing until the next year. This is being, to be sure, very inconsiderate; for the seed is going on under the ground, though it does not appear above it; and it is just as reasonable to neglect to pay attention to trees in the seed-bed, because they do not as yet produce us timber or fruit.

525. These trees come up with two oblong seed leaves, not very long, nor very broad, but too singular to be mistaken for weeds. The weeds will start along with them; and these must be kept out of the bed with the greatest care during the whole of the summer. When the plants are all up, which will be in the month of June, the ground should be stirred between them shallowly by the means of a little hook; for, having laid unmoved for a whole year, submitting alternately to the beatings of the rain and the dryings of the sun, it will become very hard; and, unless it be broken after the plants be up, they will not thrive

nearly so well. It would be good, just to break the ground all over the beds, in the month of March, with an iron-toothed rake, pushing the rake from you, and not drawing it to you, and not taking more ground than an inch or two at a time. This would make the plants come up with greater ease, and come up stronger; but you must take care not to suffer the teeth of the rake to descend deep enough to disturb the seeds, the roots from which will all be now in motion.

526. If the plants be well managed during the summer, they will be about four inches high in the month of October; for they make very little progress the first year. They should then be taken and put into a nursery, in the manner directed for the Ash in paragraphs from 120 to 122 inclusive; but, in this case, much greater care must be taken than is necessary to be taken in the case of the Ash. The *plants* are a great deal smaller, and therefore require to be put into the nursery by the hand, and in the most careful manner, taking care to make the earth very fine that you put about their roots, and taking care that they stand in the nursery precisely as deep in the ground as they stood in the seed-bed, and by no means any deeper. If the weather be very dry, just after they be put into the nursery, the plants ought to be watered, once at least.

527. They should stand in the seed-bed two years at the least, and perhaps three, for it is a plant that does not grow very fast at first. While there, no weeds should be suffered to appear, or at least none should be suffered to get out of their seed leaf. A careful hoeing should be given several times during the summer, but the hoe should be narrow, and great care should be taken not to bruise the stems of the plants; for, if once bruised, the check given

to the growth is very great. This work ought to be performed, and in the same manner, in the nurseries of all other trees; but particularly in the nurseries of those trees which must go into the nursery when but of a very small size; and the TULIP TREE is one of those.

528. In two or three years, the plants will attain the height of from two feet to three. Their side-shoots ought to be cut off at the bottom, to prevent their being too much loaded with leaf, and to encourage the growth of the stem or trunk. When they have stood in the nursery two or three years, they are at a proper age to be planted out. The planting out should be performed in the same manner as directed for the ASH, and as was before directed in paragraph 75. The *season* for doing the work is November or March; and let it be done when it may, the greatest possible care should be taken to keep the roots, during their transit from the nursery to the plantation, from the sun and the wind.

529. The TULIP TREE needs not to be cut down the year after being planted. It has a bushy root, transplants well, and it is not, in my opinion, a tree that it would be advantageous to cut down. If it were cut down, it would send up a new shoot; but I am not certain that it would send up a shoot to go on faster and better than the original one; because the root always strikes off at once; and because there would be no want of a supply of sap during the first year. If, however, from any cause, the trees were to appear to be stagnant during the first year, they ought to be cut down as directed for the ASH; for a new shoot would certainly come, and it might be equal in all respects to the original shoot. In all cases where trees are cut down with the intention of bringing up a new shoot to form a tree,

great care should be taken that only *one* shoot be suffered to remain. There will be several of them come out, but all must be taken off except one, and that, too, during the first summer. During the next winter, the trees should be looked over, one by one. The shoot that has been left to go on to become a tree, will be found, ninety-nine times out of a hundred, to have come out of the stump, somewhere considerably below the cut; so that there will remain a piece of the old stump higher up than the lower end of the new shoot. This piece of old stump, if suffered to remain, would become a piece of dead wood, which the bark of the new shoot would never cover, and which would make the tree crooked at bottom. Therefore, now, during the next winter after the trees have been cut down, these stubs should be carefully taken off with a sharp knife, in a sloping direction, the slope ending at the top, just at the point where the new shoot has come out of the stump. By two year's growth, the new shoot will cover the cut completely over; it will place the new shoot perpendicularly upon the old stump or foundation of the tree, and no man will be able to perceive that there ever has been any cutting down at all. I have mentioned this operation under the head of other trees, but I repeat the mention of it here, and with greater minuteness than before, because it is an operation perfectly essential to the growth, the health, and the beauty of a tree that has been cut down.

530. With regard to *distances*, in a plantation of Tulip Trees, we are first to consider that it is a tree calculated to produce nothing but *timber*. Poles of it would be a great deal better than those that come from the Poplars, or from the Firs; but we have things enough to produce poles; and therefore we never can plant it for the purposes of underwood; yet, as it must stand with distances sufficient

to give room for its growth to a large size, there must be something else, if we make *woods* of it, to occupy the ground beneath it. Michaux tells us, that though the tree delights most in damp situations, he has seen it mingled amongst all other trees; and that he has sometimes seen it constituting, exclusively, tracts of forest for many miles together, including hills as well as dells; so that we might plant it any where, only bearing in mind that low and damp situations are the best for this tree.

531. The ground for the plantation, ought, as in all other cases, to be prepared by good trenching, after the manner described in paragraphs from 15 to 21 inclusive, taking care to distinguish between the two methods there pointed out, and to follow that method which is calculated for the land which you have to plant in. The ground being prepared, the Tulip Trees ought to be placed in it in rows at eight feet apart, the plants at eight feet apart in the row; for the Tulip Tree does not spread like the Oak and many others. Between each two Tulip Trees, in their rows, you might plant in dry ground, Hazel or Birch as underwood: and, besides these plants put into the Tulip Tree rows, you might have, between every two rows of Tulip Trees, two rows of Hazel or of Birch; so that all the rows would stand at four feet apart, and all the plants at four feet apart in each row; and thus a coppice would be going on and yielding its profits, while the wood of the Tulip Trees would be towering up. If in wet or moist soil, the best underwood would be the Birch. The Willow would be too unruly; it would spread about too much, and could not be profitably applied without being suffered to grow to a greater height and size than those at which the Birch would become profitable. The Birch is a more trim thing, goes more upright than the Willow, affords

better shelter, and is more easily kept clean from weeds, and is better in every respect for this purpose. By the time that the coppice had been cut down the third time, the TULIP TREES, having been kept carefully pruned of their shoots, would have clear stems of a considerable length, and would cause so much shade and drip, as to render the coppice of little value for the future; but now there would be a *wood* amply to compensate you for the loss of the coppice.

532. I must mention here, that which I omitted in former articles, where I spoke of this method of planting a mixture of *timber trees* and *underwoods;* and that is, that you must, when you have cut your coppice, carry off the produce on the *backs of men*, and not suffer wagons or carts to go into the plantation for that purpose. Carters have no more mercy on young trees than they have on flint stones, and never appear to think them of more value. I have seen, in the clearing of a coppice, thickly set with young Oaks that had come up from the acorn, more than a hundred of those Oaks trampled down by the horses, run over by the wheels, broken off, or torn in their bark, during the loading and carrying off of one single load of worthless brush-wood, of so little value as for the bundles of it to be sold at five or six shillings the hundred; and this is the general practice throughout the whole country, as far as my observation has gone. The produce of the coppice is put up in heaps here and there, and the wagon, which in this case is one of the most complete instruments of destruction that ever was invented by man, goes about, first in one direction, then in another, destroying as it goes, and leaving behind it, where there is a thick plant of young OAKS and ASHES, ten times as much mischief as the produce of its loads brings good to the owner of the coppices. Even

where there are no young trees to destroy, the carting does incalculable injury to the underwood itself. To be sure, it ought to be done, and it generally is done before the stems of the underwood begin to throw out their new shoots. Nevertheless, the wheels of the wagon and the feet of the horses, do very great injury to those stems. They wound and bruise them; they batter them about in such a way as frequently to cause them to die, and as always to weaken the growth of their shoots. The wagon, in a coppice of eight or ten acres, will make, perhaps, not less than fifty, and, more likely, a hundred turnings or half-turnings, if a wheel come in contact with a stem in such turn, it half grubs it up; or, at the very least, it destroys half its powers of future production; but where there are young trees left standing in the coppice intended to become timber, the havoc is absolutely frightful. Very careful people have the produce of their coppices *backed out*, as it is called in the country; but few persons calculate the loss of the future, when a trifling saving is presented to them for the present.

533. But, if a coppice be large, and of a square, or nearly of a square form, it is very tedious and expensive to carry all its produce to the outsides on the back; that produce being very bulky and heavy. Therefore, if the coppice or plantation be large, and not very long and narrow, so as to make the distance to the outsides of it short, there ought to be a road made in the coppice; and but *one road*, by any means. This road should wind about with *gentle turnings*; turnings so gentle as to leave the carter no possible excuse for running over the young trees, or over the stems of the coppice wood. This road might so wind about, according to the shape or extent of the coppice, as to leave no where any very great distance for the stuff to be carried on backs. The road might come out and end where it began; and

though it would, perhaps, occupy a twentieth part of the ground of the coppice, it would be attended with gain, even if it occupied a fifth or a sixth part; for the trees would cover the road with their branches, and they might stand closer on the edge of the road, than generally throughout the coppice. During the ten years, or thereabouts, and every successive ten years between the cuttings of the coppice, a good produce of rough grass might be cut in the road, yielding not so much profit as so much of the coppice land to be sure, but yielding something at any rate, while the advantage of such roads for the purposes of sporting would be too obvious to need a particular description. While the coppice stuff remained low, here and there a bit of the road might be ploughed up and sowed with grain, particularly with buck wheat, which the hares and rabbits do not touch, for the entertainment of the pheasants; a thing by no means to be left out of our consideration, since pheasants there will be, and men there will be who delight in the preserving of pheasants. To be sure, the poachers would be aware of these resorts, as well as the owners of the coppice; but they are aware of all the resorts already: and besides, pheasants are by them destroyed in the night, and they do not roost in the roads.

534. To return to the Tulip Trees: they are not apt to throw out stout side-shoots, unless raised from layers; and in the woods of America they have clear trunks, without any pruning at all; but it is better to cut off the lower side-shoots than to suffer them to die off; and therefore that should be done in the manner directed for the Beech, in the latter part of paragraph 149.

535. The Tulip Tree ought, like other deciduous trees, to be cut down in the winter, when it is fit for timber; and

its stool and roots ought to be completely grubbed up, to make room for the planting of something, or the planting of other Tulip Trees; for, though it will send shoots enough out of the stool, those shoots never become trees, and are of very little use.

536. If Tulip Trees be intended for clumps, for avenues, or for independent trees, they must be fenced, and, in all respects, treated in the manner so fully described in the case of the Plane, to which the reader will now please to refer.

537. I cannot conclude this article without expressing my hope that some gentlemen in England will be induced to plant and to propagate this tree, not only for ornament, but for the sake of the timber, and, consequently, upon a considerable scale. The means are not at all expensive. The seeds are easily obtained in the States of New York, New Jersey, and Pennsylvania; they are as dry as so much chaff; they may be kept, if in a dry place, for almost any length of time, so as to suit the convenience of sowing; and, that they are easily raised from the seed I have proved, having sold several thousands of the plants this year. But, if a man will not write a letter upon the subject; if he will not take the pains to have the seed brought over; if he will not, with his *own eyes*, see the seed sown, and the plants, and the planting, and the pruning attended to; if he will not do these things, he cannot have the trees, for, as to purchasing them of those who raise the trees from *layers*, each plant, to say nothing of its being a mere branch of a tree, will cost him five shillings, or half-a-crown at the least; when a couple of dollars worth of seed from Pennsylvania or New York, would give him from ten to twenty thousand plants. If he will insist upon believing his gardener, who will have no scruple to tell him, that

plants will no more come from those bits of dry, rubbishy bark than they would come out of saw-dust, and that he will be "bound to *eat* all the timber that ever comes out of them;" if he will persist in believing this, as I might have done if I had listened to a botanist of this description; if he will be guided by his servant and not by his senses, he cannot have the trees, that is all. Every gardener thinks that every one who employs him, is, as far as relates to gardening, a natural-born fool. He will allow him to be, and indeed he will boast of his being, the greatest of orators, the greatest of generals, the most valiant of admirals, the most profoundly wise of lawgivers, the most heavenly of all heaven-born ministers, the most pious and learned of bishops, the most learned of all learned lawyers, and, if a physician, capable, almost, of raising the dead to life; but that, in matters of *gardening*, he will insist that he is essentially a fool, and that he does not know, and ought not to know, any more about the raising of a tree, than he, the gardener, knows of any of the learned professions, a profound knowledge in which he is ready (with or without cause) to ascribe to his master. One of the consequences of this way of thinking is, that gardeners, if the master be of a character that makes it perilous to flatly contradict him, hear, with very little interruption, all that he has to say, and all that he relates to them as having been said by others. They receive his directions very quietly, then go away, and pay no more attention to them than to the whistling of the winds; and as to *books* that may be put into their hands, if not written by a professed gardener by trade, they would laugh at the idea of any one supposing it possible that they can contain any thing worth looking at. If, therefore, those who wish to have TULIP TREES will not look to the sowing and to the subsequent work with their own eyes, their best way is to content themselves with the wish, and leave the grati-

fication to those who will insist upon the thing being done, and who will *see* it done themselves; and no great matter either, for, perhaps, it would not take up one week altogether, from the beginning to the end, to superintend the whole of the work of a considerable plantation, from the sowing of the seed to the final planting out; which I think I am warranted in saying, when *I have been able to spare the time* to see the thing frequently done as far as the raising of the plants.

THE TUPELO.

In Latin, *Tupelo;* in French, *Tupelo.*

538. The botanical characters are:—Calyx tubular, superior; stamina inserted at the commencement of the tube; ovarium inferior; one stigmated style generally single; capsul or berry containing a single seed.

539. This tree seems to have been wholly unknown to Miller. Michaux gave it the botanical name of Nyssa; but it appears from him, that Linnæus never inserted it in his catalogue. There are three varieties of the Tupelo; one is called simply the Tupelo, another the Sour Tupelo (*Nyssa Capitata*), the third is called the Large Tupelo (*Nyssa Grandidentata*). The two former are small trees compared to the last, which attains the height of seventy or eighty feet, with a trunk from a yard to four feet round at five feet from the earth.

540. The wood of this tree is not of such value as to induce me to recommend it to be planted for profit. It appears from Michaux, as well as from what I have seen and heard of it myself, to be of very little value; but, in its form and its foliage, it is a singularly beautiful tree, and grows very fast. I have some plants now at Kensington more than a foot high, though sown only in April last.

541. The SEED of this tree is a berry in the shape of an egg, and of about the size of a small filbert. There is a pulp on the outside; then comes a ribbed shell, and within that shell a kernel. I have received the seeds from America packed, or rather put into a barrel, mixed with dry sand. There is very great difficulty in obtaining the seeds, which arrive in the winter, and are sown in the spring. The plants come up very boldly early in June; they are two or three inches high in a very short time, and have oblong seed leaves, which are more than an inch long. In October they are very fine plants, and in November, or in the ensuing month of March or April, they ought to be put into the nursery, in the manner directed for the Ash. A year is long enough for them to stand in the nursery, and they may then go to their final situation. In clumps, in independent trees, in lofty ornamental plantations, in avenues, the LARGE TUPELO would form a beautiful variety with the PLANES, the LIMES, the TULIP TREES, and other trees of ornament. The leaf is, as I said before, singularly beautiful, as is the bark of the tree, and particularly the bark of the twigs.

542. As to the pruning, the cultivating of the ground, and other parts of the management, they may all be the same as has been directed in the case of the TULIP TREE. The root of the TUPELO is bushy, and causes the plant to be removed without risk. With regard to the cutting down of the plant the year after it is planted out, I look upon the TUPELO as being entitled to just the same observations that I have made with regard to the TULIP TREE.

543. The other two TUPELOS are inferior in height and size to the great TUPELO. The common TUPELO rarely exceeds forty feet in height, and the SOUR TUPELO does not rise quite so high; but they are both of them trees of great

beauty, and particularly the Sour Tupelo, the leaves of which are from five to six inches long, are of a pale green at top, and whitish on the under side. The wood of the common Tupelo is highly esteemed for some few purposes, on account of its inaptitude to split. For this reason wooden bowls are sometimes made of it; various other things are made out of the wood, where it happens to be found in abundance, and to stand in the way of the farmer; but this is upon a very limited scale, and I regard these trees solely as trees of ornament.

THE WALNUT.

In Latin, *Juglans;* in French, *Noisetier.*

544. The botanical characters are the same, in all respects, as those of the Hickory, which see in paragraph 292.

545. The English Walnut-Tree is too well known to need a particular description here; but there are two distinct varieties of the American Walnut, and both of them good as Timber Trees. I shall first speak of the manner of raising Walnut Trees generally, and then give an account of those of America.

546. There are several different varieties of our English, or European, Walnut, which the botanists call *Juglans Regia.* These varieties, however, are distinguished only by the different size of the fruit, its different thickness of shell, and by the different qualities of the fruit. In outward appearances all the varieties are alike; and there is no difference, that I know of, in the wood of any of them.

547. The Walnut-Tree is raised from the seed, and *only* from the seed. The Walnuts, when ripe, and ascertained to be sound, which may be done by putting them into

water, in the manner directed for the Beech, in paragraph 145, should be made perfectly dry, and then preserved in dry sand, in the manner directed for the Beech, in paragraph 145. They may be kept in this state until the month of March or April, when they must be sowed in beds formed in just the same manner as the beds are formed for the sowing of the Ash, to which I have so frequently referred that the reader will, by this time, remember the directions perfectly well, I hope, without reference to the particular paragraph.

548. But, as to the *depth*, that is different in this case; for the Walnuts are large things and require comparatively a deep covering. They should be scattered upon the beds rather thinly; and that being done, they should be patted down well into the ground with the back of the spade; for, otherwise, heavy rains will lay them bare before they have struck root; or they will be moved by worms, which is pretty nearly as bad. Rooks and jackdaws will hook them out of the ground if they perceive them; and if they have begun to open, they will split them with their beaks, and then peck out the kernel. I have seen them do this several times with my American Walnuts, which are much harder, and more closely put together, than the Walnuts of this country. Therefore, they should be fixed as firmly in the ground as possible, before the earth be laid on them, and they should not be sowed too near to the edge of the beds, for fear of washing out by the rains.

549. When they are well and firmly placed upon the beds, they should be covered with earth pretty nearly three inches deep, and the earth should be made very fine, level, and smooth. They will come up very boldly in the month of June, they ought to be kept constantly clear of weeds dur-

ing the summer; and if well managed they will be a foot and a half high in the month of October, that is to say the American Walnuts will, but the English Walnuts will not be so high. They would be very little higher if sowed in the fall, instead of the spring; and they might be raked out of the ground, by various vermin, and particularly by mice; the moles also might annoy them; and the worms, together with the beatings of the rain and the heavings of the frost, would render success much more doubtful, than if the sowing took place in the spring.

550. The seedling Walnut has a long big tap-root, of softish texture, and has few fibres attached to it, and those few not of any considerable length. It is a tree therefore, that is never to be moved without care. The American Walnuts have larger and longer tap-roots than the English Walnut. When the seedlings are removed from the seed-bed to the nursery, which they should be in the month of November, or March or April, the tap-root should be cut off to about eight inches in length; and the plants, having been first sorted or sized, should be put into the nursery in the manner directed for the Ash, but with greater care. The earth should be made very fine about the root, which should be very firmly fixed in the ground by hand and foot, and, if the weather be dry at the time of performing this work, it would be good to give the plants a good watering in a couple of days after they have been planted out, taking care to let the ground be thoroughly dry upon the top before you water.

551. These trees ought to stand in the nursery *two years*, because, they will require that time to get good root and to fit them for their final removal. When they are finally removed, you will find many side-roots to have come out

of the part of the tap which you left when you put the plants in the nursery. These roots must be pruned in the manner directed for those of the ASH, and the planting out must take place with all the precautions so strongly recommended in the removal of tap-rooted or evergreen trees.

552. People do not make *woods* of ENGLISH WALNUT trees; but, when I have described the uses of the AMERICAN WALNUT wood, the rapidity of the growth of the trees, and the facility of obtaining the seed, I think it will want little to convince an English planter, that wood of this sort of tree, is a subject very well worthy of attention. Our WALNUT TREE seldom has a clear trunk of any considerable length, and it is the same with the AMERICAN WALNUT; but, these trees throw out great limbs at about ten or fifteen feet from the ground, and spread over a large piece of ground. The American Walnuts are two in number; one is called the BLACK WALNUT (*Juglans Nigra*); and the other the Butter-Nut (*Juglans Cathartica*). The seed of the first comes in a large round green shell, which contains a large round WALNUT very deeply furrowed. The BUTTER-NUT comes in a green shell, in the shape of an egg, and about the size of a small common hen's egg; and it contains a WALNUT of nearly the same shape, but sharply pointed at the small end, and still more deeply furrowed than the former.

553. The BLACK WALNUT is, however, the finest tree, and is one of the finest trees in size, in height, in spread of head, and in leaf both of quantity and shape, that there is to be found in the world. Our English Walnut wood is very brittle stuff, and serves for very few purposes, that of making gun stocks being the principal. Some articles of furniture were formerly made of it; but it is never used

now for that purpose, and never was fit for it. The Black Walnut of America is famous for its timber, and also for its immense size; and for the soundness and durability of its wood. I have frequently seen this tree sixty or seventy feet high, and so large round the trunk, that I should be afraid to say how large, if Michaux had not told us, that it is by no means rare to see them six or seven feet in diameter, at several feet from the ground. There is now at New York a part of a Black Walnut Tree trunk, which had been scooped out, and was used as a *bar-room*, and afterwards as a grocer's shop, having a door and two windows in it. A little pamphlet published at New York, where this trunk is now exhibited, as serving for a parlour or dining-room, states the trunk to have been THIRTY-SIX feet round at the base; and of course TWELVE feet through; it states, that the height of the tree previous to branching was very great, and that the height to the tops of the branches was one hundred and twenty feet, and that the spread of the branches was in proportion to the height. It further adds, that had the tree been sawed into inch boards at a saw mill, it would have yielded fifty thousand feet of board, worth, at the wholesale price, one thousand five hundred dollars, or about 350*l.* sterling.

554. This however must be regarded as a singular instance of grandeur; but it is quite common, even in the light lands of Long Island, to see this tree of immense size in the trunk, lofty in proportion, and extending its branches to a distance that strikes the beholder with wonder. Shade is a valuable thing in a hot country; and one of these trees very frequently forms a complete shade to a house and other buildings of a considerable size.

555. But it is for its timber, after all, that this fine tree

is so valuable as it is universally esteemed to be. The wood, after a short exposure to the air, assumes a dark shade, and in time becomes darker than the oldest and darkest mahogany; and hence, certainly, it has derived the name of *Black Walnut*. This wood remains sound during a great length of time, even if exposed to the influence of heat and moisture. The proof of its great durability is, that farmers frequently use it for *posts* in the fences that surround their fields. It is very strong and very tenacious; when thoroughly seasoned not liable to warp or split, and its grain is sufficiently fine and compact to admit of a beautiful polish, to which advantage it adds that of remaining always secure from worms. The timber is used in the building of houses, in the making of gun stocks, and in the making of *naves* for wheels. MICHAUX says that this tree is excellently adapted to certain uses in naval architecture; that it affords, not only an abundance of *knees*, which are so much wanted in ship building; but, that, it enters into the frame of the ship also. He says, that it is not attacked by sea worms in warm latitudes, as the OAK is; he says that he has seen canoes of it, scooped out of a single trunk more than forty feet long. In comparing it with the EUROPEAN WALNUT, he says, that the wood of the BLACK WALNUT is more compact, heavier, and much stronger; that it is susceptible of a finer polish, and that, it is not, like the EUROPEAN WALNUT, liable to be injured by worms. He adds one indubitable proof of the high esteem in which the wood is held in the native country of the tree; namely, that it has been *spared by the farmers in America*; and spare it, they would not, if they wanted the fire-wood that it contained, or the land that it grew on, unless they regarded the wood as of extraordinary value.

556. As to the quickness of growth, as compared with

that of our tree, I have seen instances enough to convince me that it will come to timber in half the time, and MICHAUX says that the two sorts having been planted at the same time and in the same soil, the BLACK WALNUT has been observed to shoot more vigorously, and to grow in a given time to a greater height. On every account as a timber tree, this WALNUT is far superior to the European, and it is not of *fruit* we are here talking.

557. The Butter-Nut takes its vulgar name from the circumstance, that the nut yields an oily matter, which soon becomes "*rancid*," and that is obtained by the Indians, by pounding and boiling the nuts, and taking off the oily substance which swims upon the surface, and "mixing it with their food!" These people must be nearly upon a level with the Cossacks in point of delicacy of taste at the table. To be sure, to give the name of *Butter-Nut* to a thing which produces a substance, the very smell of which is enough to drive people of common nerves out of the house; this is, to be sure, a monstrous misnomer; but *names* do a great deal in this world; and I have really seen a great many people, that seemed to lick their lips at the hearing of the name of the *Butter-Nut* pronounced. The BLACK WALNUT will yield to nothing but a very stout and heavy hammer; and when you have got the kernel out, it is so oily and so "rancid," that to eat half a dozen is sufficient to make any common person sick.

558. It is not therefore trees to bear food that I am talking of; and the BUTTER-NUT, except for the sake of variety as an ornamental tree, is not worthy of any great degree of attention: the tree is inferior in point of size, is slower of growth, and its wood is in quality vastly inferior; though it also possesses the quality of long duration, and of being

free from the annoyance of worms; and is, therefore, frequently made use of as *sleepers*, which are placed immediately on the ground, in the framing of houses and barns; and its long resistance of alternate heat and moisture causes it to be esteemed for the posts and rails of rural fences, which is a certain proof of its possessing the quality of durability.

559. As, however, all its good qualities are to be found in the Black Walnut, with none of its bad ones, the latter is the tree which we ought to cultivate. Of the manner of that cultivation I have spoken above; and it now remains for me to offer my opinion with regard to the distances at which these trees ought to be planted, when intended to become a wood for the producing of timber.

560. From what has been said about the prodigious spread of the head of this tree, it would be nonsense to think of planting them at less than thirty feet apart, with an intention of their standing to become large trees; for, supposing the branches to extend only fifteen feet from the tree in every direction, the heads of the trees would then meet, and a Black Walnut tree will extend its branches much more widely than this.

561. If planted, therefore, in rows thirty feet apart, and at thirty feet apart in the rows themselves, there would be room for six plants of Hazel or of Birch between each two Walnut Trees along the Walnut Tree rows, and for six rows of either Hazel or Birch, at four or five feet apart, between each two of the Walnut Tree rows. The coppice would go on in just the same manner as described in the case of the Tulip tree; and the Walnut Trees would go on rising by degrees; till the coppice were totally sub-

duced by the shade, and until there were a beautiful wood to supply its place, as an object of profit.

562. No tree when cut down after being planted, throws out a stronger and more vigorous shoot than the Black Walnut; but this tree should not be cut down until the *second* year after being planted, because its root is rather shy, and does not become strong enough to send up a firm and long and vigorous shoot, when that root has stood only one year in the ground. These trees, therefore, should be cut down the second year after planting. Great care should be taken that none but one shoot be left to go up, and the pruning of the stem, to make that one shoot cover the cut at the bottom, should be even more carefully attended to than in the case of the Tulip tree.

563. This tree, as was before observed, is prone to throw out large side-shoots, when young; and, of course, to have great limbs at no very great distance from the ground. In a wood, it would be desirable to prevent this spreading too soon, and great care ought to be taken to prune off the bottom side-shoots in time, with a sharp knife and a close and smooth cut; and to continue to do this as the tree mounts, until you have got a trunk of the length you wish to have.

564. If the trees be intended to produce *knees*, then they may be suffered to spread much earlier. As independent trees, or three or four together standing in a clump, or in lines to form an avenue, you might have them according to your taste, with long trunks or short trunks; but the best taste, probably, would be to prune them up with a straight trunk to about forty feet high, or then let their heads spread till they meet. The avenue ought not to be less than forty feet wide, and at this distance from each other the

trees would form a roof over it, perfectly completed before they were sixty feet high.

565. Of all the trees that I know any thing of, nothing equals the Black Walnut as a *single tree*. Its spread is immense. If pruned up to about ten or fifteen feet high, and then left to take its own course, its great spread, its load of fine leaves, the shade that it gives, its erect and bold attitude, and its defiance of the winds, make it one of the noblest objects that the eyes of man can behold. When near to houses, it, in times of great heat, serves the family as a place to sit under during the intolerable ardour of the sun. The shade is so complete, and the lower branches, which are rather pendulous, reach so near to the ground with their points, that you are here sitting, not only completely out of the sun, and without a hot roof over you, but you have, at the same time, the advantage of every breath of air that is stirring.

566. I remember, with feelings of singular delight, that, on the 11th of July, 1818, when the thermometer of Farenheit was standing at more than a hundred degrees, I, sitting under the shade of a Black Walnut tree, wrote that letter (addressed to Mr. Tierney), which ought to have warned Mr. Peel and the Parliament of the great dangers of passing that Bill (for restoring cash payments without concomitants), which, however, they did, nevertheless pass, in a year and a few days after that time; and which Bill has caused, is now causing, and will still cause, calamities to this country, the extent of which no tongue nor pen can describe.

567. Thus I conclude my observations, with regard to this magnificent and useful tree, which I cannot take my

leave of, without expressing my hope that I shall live to see many persons making plantations of it in England.

THE WILLOW.

In Latin *Salix*; in French *Saule*.

568. The botanical characters are:—It has male and female flowers on separate plants; the male flowers are disposed in one common oblong imbricated katkin. The scales have each one oblong spreading flower, which has no petal, but a cylindrical nectarious gland in the centre. It has two slender erect stamina, terminated by twin summits having four cells. The female flowers are disposed in katkins like the male; these have neither petals nor stamina, but an oval narrowed germen, scarcely distinguishable from the style, crowned by two bifid erect stigmas. The germen afterwards becomes an awl-shaped capsule, with one cell opening with two valves, containing many small oval seeds crowned with hairy down.

569. This tree is so common in England, and there are so many sorts of Willow, that to enter into a minute description of each would be quite useless to any reader, and would take up more room and more time than any one but a mere Botanist would deem the subject worthy of. MILLER has fourteen species of WILLOW, and MICHAUX has two: but as the mode of propagating, rearing, cultivating, and generally the mode of cutting down all the sorts is the same, one set of directions will, with few exceptions, serve for the whole.

570. WILLOWS may, if we please, of almost all the sorts, become considerable trees; trees of a large trunk and great height. The wood of some of the Willows is not bad, even as timber; but the general purposes to which the WILLOW is applied, cause it to be regarded only as un-

derwood. There are two purposes to which it is applied, of a very distinct character: one, the making of hop-poles, hoops, hurdles, and tool-handles; the other, the making of baskets and wicker-work of various descriptions. Those Willows which are applied to the former purpose are planted in *coppices;* those which are applied to the latter purpose, are planted in aquatic situations, which are generally called Osier-beds. The former are cut every eight or ten years, according to the growth of the stuff, which will be in proportion in rapidity to the goodness of the ground; the latter are cut every year, as soon as the leaf is off, and as the shoots are perfectly ripe.

571. Willows are never raised from the seed, though they all might be; and though they would, if a large and straight and lofty tree were wanted, be raised most properly in that way. The *seed* of the WILLOW, like that of the POPLAR, is borne in a katkin, which comes out early in the spring, and which falls off from the tree, some of the sorts earlier and some later, in May, or early in June. If the katkins were then collected, laid in the sun until perfectly dry, and then rubbed out and sowed in the same manner as I have described, and as I have so successfully practised in the case of the BIRCH, any number of trees might be raised from the seed; and these trees properly transplanted and managed, would become straight, clear-trunked, and lofty trees; and this might, in some cases, be very desirable, for some of the sorts are greatly ornamental, besides the WEEPING Willow, which is every where looked upon as an article of ornament. There is one WILLOW, the bark of which is of a light grey colour, which sends its katkins forth very early in the spring. They are large, clothed with a thick down, the outside of which is a bright yellow, after having first been white; and, for the space of nearly a month, at

a season when there is scarcely any thing in vegetation to glad the eye, this tree is a very beautiful object; and it grows, too, in any ground, from a dry bank to a sour clay or a bog.

572. I am, however, though reluctantly I must confess, compelled to give up the expectation of ever seeing or hearing of the WILLOW of any sort being raised in any other way than from poles, stakes, truncheons, or cuttings; and, therefore, I shall now speak of the manner in which this is usually done, first taking the Willows which are usually planted in coppices.

573. When the ground is ready for the planting of the coppice, you proceed in one of two ways; planting by poles or by truncheons. The distances at which Willows should be planted, is in rows at five feet apart, and the plants at five feet apart in the rows. If you propagate by poles, you make lines across the piece of ground five feet apart, make a trifling channel with a spade or hoe along the line, then lay down WILLOW POLES in this channel, one following the other, length-ways all along the line; so that you now have a line formed of poles. Then cover the poles over with earth pretty thickly, except that you are to leave six or eight inches of the poles exposed in every five feet. So that now you have a little ridge of earth (not above an inch or two high) going from one side of the piece of ground to the other, with six or eight inches of pole visible at every five feet from each other. Then you make another line, and proceed to lay down poles, and to cover them in the same manner. This is the best, the surest, the quickest, and, in the end, the cheapest way of getting a WILLOW coppice.

574. Roots will come, or rather go, out of every part of the pole into the ground, and shoots will come upwards from those parts of the poles which are not covered. The whole pole becomes a main root or set of roots, and the little parts left uncovered become so many stems or stools, which will produce a crop, and a pretty large one too, several years sooner than you can get the first trifling crop from the truncheons. This work should be done in February or early in March, and as soon as convenient after the poles are cut.

575. If you proceed by truncheons, that is to say, by WILLOW cuttings an inch through or thereabouts, or perhaps more, these should be about two feet long, and put into the ground at the distances above-mentioned. Both ends should be cut off smoothly with a sloping cut, and the butt end, of course, put into the ground; but not by thrusting down by main force, but by making a hole with something else to the proper depth, and putting the truncheon down into it, and then treading round it and fixing it well in the ground, as you would a young tree, leaving about three or four inches above the ground.

576. This work is also to be done in February or March. Several shoots will come out of each plant the first summer, but the whole of them except one should be taken off during the next winter, in order to give stoutness to the stem or trunk. During the next winter the stems are to be cut down to the ground, and then be suffered to go on to become a coppice. This is a poor way of doing the thing compared to the other way, and here are two years lost into the bargain; but the great obstacle is the first cost: the truncheons are worth little or nothing; but the poles, especially in hop countries, are worth forty or fifty shillings the

hundred. There stands the hop-planter, holding out the fifty shillings; and this sight, this charming and tempting sight, soon overpowers that philosophy, which teaches the coppice-owner that he would gain the fifty shillings, ten times told, perhaps, by using the poles in the making of a new coppice. Nay (and this is a great deal worse) the planter may have to *buy* the poles, while any neighbour will give him the truncheons, and it certainly requires a little less expense to put in the truncheons than to buy the poles. Faith! here is a great deal more than sufficient to decide the question in favour of the truncheons, which thus become living and gay tenants of the coppice, instead of making their exit in the fiery furnace of a baker, or in the still more ardent flame of the lime-kiln.

577. However, I did once see a man that raised a coppice from Willow Poles, and it was worth, acre for acre, and at parallel age, four times as much as any other Willow coppice that I ever saw in my life. It was next to impossible to work one's way through it. It was about seven years old; it was fit then to cut for hoops and hurdles; and I believe it sold by auction, the next year, for thirty-five pounds an acre, though the general run of coppices did not fetch, at that age, more than seven or eight pounds an acre; and, if I recollect rightly, the poles had been laid only about fourteen or fifteen years. But the truncheons could have been had for *nothing*, while these poles must have been worth forty or fifty shillings a hundred.

578. These poles, however, need not be prime poles. They ought to be stout, but need not be of great length; and, if a little crooked, it is of no great consequence. By lowering the earth in certain places, raising it in others, and with the use of pegs to fasten down the ends of

them, poles not of the straightest description may do very well.

579. There are several sorts of Willows, that grow promiscuously in the coppices. To give to these their botanical description would be perfectly useless; but there are two sorts, which prevail greatly over all the rest, in the estimation of woodmen, and which indeed are the sorts that thrive best, and produce the greatest quantities of hoops and poles. They very much resemble each other in outward appearance, whether as to leaf, bark, and every other circumstance, but which have a clear distinction in the colour of the wood; one having a *red heart*, and the other being white all the way through. The WHITE-HEARTED WILLOW is good for very little as a hop-pole, while the RED-HEARTED WILLOW will last nearly as long as the ASH. The difference in the qualities holds good in the making of hoops, hurdles, rods, and every thing else to which the wood of the dry land Willows is applied.

580. The WILLOW, like other coppices, is cut in the winter, and the stuff converted to its various uses as quickly as possible. The coppice ought to be cleared by the beginning of March, and ought not to be begun to be cut until the whole of the leaf be completely off. If you begin cutting too soon, you injure both the crop and the stools; seeing that the sap has not wholly descended from the former, and seeing that the latter will *bleed*, and be thus deprived of parts of its powers of reproduction.

581. Under the head of TULIP TREE, I have said enough about the horrible consequences of clearing coppices by the means of wagons and carts, and I beg to be understood as repeating here all that I there said on the subject;

for it never can be too firmly fixed in the mind of the reader.

582. I have now to speak of aquatic Willows. All Willows will grow in watery places, but all Willows will not produce rods and twigs wherewith to make baskets and wicker-work, for some of them are as brittle as any other tree that I know any thing of. The Willow which is generally planted in watery places to produce rods which are called osiers, has a very long and pointed leaf, and a yellowish-coloured bark on the young shoots; and this is the reason, I suppose, for this and some other Willows being called Sallows. There is another sort, with a broader leaf, and of a whitish hue in both leaf and bark of the young shoot, which grows faster than the former one, but it is coarser, and not so very pliant; but it is probably fitter than the former for large wicker-work.

583. These things are planted, very frequently, almost in the water; and they will not thrive well, or at least will not be productive for the purposes before-mentioned, unless the situation be very wet. Generally they are in water in flood times; and half in water, that is to say, half the roots are in water at all times. The crop here is like a crop of grass, it comes every year. The rods are cut off close to the stem after the leaf has fallen and the wood has become ripened. The produce is tied up in bundles, and afterwards carried away to be sold to basket-makers and other persons who make wicker-work. This is a most useful plant; the produce is very great; and the good of the thing is, that any mere swamp is a good place to have the plantation in, unless, however, observe, the sea-water, or salt water, or water strongly impregnated with the sea-salt, have access to the swamp, for, let it be observed, that no tree will live

for any length of time in soil into which salt water can come.

584. The manner of planting osier beds, as they are generally called, is this:—You take stout rods, which are cut for the making of baskets, and cut off the butt-ends of them. These butt-ends you plant in rows at four feet apart, and at two feet or a foot and a half in the row. Do not thrust these cuttings down into the ground, but make a hole to receive them; for, by thrusting down the cuttings, you run the risk of stripping up the bark from the butt of the cutting; and it is the bark, and not the wood, out of which the roots are to grow.

585. If the situation be such that there are occasional overflowings from a river or brook, the cuttings which ought to be about three feet long, and two feet of which ought to be put into the ground; these cuttings ought, in such case, to be put in in a direction sloping towards the river or brook, which would tend to prevent them from retaining dead weeds, and grass, and leaves, which the water would cause to swim upon the surface. If the situation be flat, and not liable to such inundations, it is better to put the cuttings into the ground perpendicularly.

586. Several shoots will come out of each cutting the first year. The main shoot should be suffered to go up, but all the rest should be cut off during the next winter. By the winter after, there would be a stout stem with several shoots upon it. The shoots should be all cut off then; and after that, the stem itself should be cut down to within about three or four inches from the ground; not quite so low, perhaps, in situations that are very wet. After this, the crop becomes annual and regular. By frequent cuttings off

of the shoots or twigs, there comes a sort of head to the stem, and, in some cases, this head gets to be a foot over; and as shoots come from almost every part of it, the annual produce is prodigious. The grass and weeds will, in such situations, rival the shoots in growth; and they ought to be cut off about Midsummer, tied up in bundles, and carried out of the osier-bed. The produce would probably pay for the labour; and they do a great deal of harm to the shoots, by keeping the lower parts of the large ones from the sun, and by greatly diminishing the length and even the number of the small ones.

587. To have WILLOW TREES on the banks of rivers or brooks, the usual way is to put in *stakes*, from six to twelve feet long, and from three to five inches through at the bottom. Such *stake*, or rather pole, is put in in the month of February, or early in March, as soon as convenient after it has been cut. The bottom of the stake or pole should be cut off with a sloping cut, very smoothly, leaving no ragged parts either in wood or bark; for these die and prevent the root from being sound. The point of the stake or pole should be cut off in the same manner. The stake or pole should be put into the ground by the means of an iron bar, or some pointed thing sufficiently large to make a hole suited to the bigness of the butt of the stake or pole. Then the ground should be well fastened round the butt. The stake or pole will strike root immediately, and all the part which is above ground will send out shoots during the summer.

588. As you wish to have something of a clear trunk, you must prune off the side-shoots to the height at which you wish the head to begin. The head will then go on growing and spreading. If the tree be of the SALLOW kind, you will,

of course, cut off the produce every year for the purposes of wicker-work; but if the tree be of any of the other kinds, the produce will be fit for little else than fuel; but this produce is very large, and a crop is yielded of good stout fire-wood about every six years; and, as Willows do little harm in meadows, and perhaps, no harm at all, the edges of rivers, brooks, and deep ditches, always ought to be well garnished with them.

589. There is one sort of Willow, never seen in coppices or meadows; but very well known to nurserymen and gardeners under the name of the Yellow Willow, a name exactly descriptive of the colour of the bark in every part of the tree. It throws out a great abundance of slender twigs, and these twigs, in summer as well as in winter, are as tough, as pliant, and as strong for any temporary purpose as any piece of common string or cord of the same thickness. You may take one of these twigs, tie a bundle up with it, and finish by making a bow, in the same manner as with tape, or with packing-thread. For this reason, there is no nursery, and scarcely any considerable garden, without one or two trees of this kind standing in some corner of the ground, for the purpose of affording a constant supply of twigs.

590. There remains only to speak of the Weeping Willow. It is the only Willow planted for ornament, and which is, indeed, good for very little else; but as an ornamental tree it is surpassed by very few, adding to its fine colour and elegant disposition of its branches, the pleasing circumstance of coming out in leaf amongst the very earliest of the trees in spring, and retaining its leaf in the autumn long after the leaves have all disappeared from the greater part of deciduous trees. But, though this tree may be

raised, by stakes or poles, in the manner before-mentioned, it can never be a fine and lofty tree if raised in that manner; and it would be absurd to expect it. This tree would grow to sixty feet high, if raised from the seed, and that it might be, I am sure, in the manner which I have spoken of above; but if not raised from the seed, small cuttings at most ought to form the foundation of a Weeping Willow tree. These cuttings ought to be, like those of the osiers, from the butts of shoots of the former year. They ought to be put into a nursery to strike, putting about a foot of them into the ground, and leaving not more than an inch out of the ground. One shoot ought to be suffered to go up the first year. There ought to be careful prunings of the stub at the bottom; and, in the next spring or fall, the tree ought to be taken up, its roots pruned, and then it ought to be carefully planted upon the spot where it is intended to abide. Here it might be cut down again the first year after the planting, and a single shoot suffered again to go up; but this shoot would be so long and so slender in the upper part of it, that, if left at full length, the tree would become a curved thing at once. Therefore, it ought the next year to be cut down, within two feet of the point where it was cut down before, and another single shoot suffered to come out and to go on, as near to the last cut as possible; and thus you ought to proceed till you have got a trunk of the length that you wish to have it. Then the head may be suffered to spread away from the straight trunk in every direction. The side-shoots being kept constantly pruned off, all the little crooks made by the several cuttings would soon grow out, and would leave no trace of there ever having been any: the trunk would be straight and smooth from one end to the other.

591. From all that has been said upon the subject of the

Willow, it is evident that it surpasses every thing else in value in watery situations; and it does not much care whether the water be running or stagnant. Any little dell that is kept constantly wet by the oosings out from the sides of a hill, is admirably adapted for any of the Willows, and the crop which they produce is prodigious. As dry coppices, they are very good, and produce a greater crop of hoops and rods than either the Birch, the Hazel, or the Ash. I have seen one single red-hearted Willow stem, that produced upwards of two hundred hoops, each rod being split into two hoops. But there must be room for this, and the Willow should not be planted in good ground at distances less than rows at six feet apart, and plants at six feet apart in the row; and, in such ground, the poles mentioned in the former part of this article should be laid in rows, at six feet apart instead of five, and the lower parts, for the shoots to come out of, should also be at six feet apart. The quality of the Willow, for rods, hoops, and poles, is inferior to the Hazel; but it is equal to the Birch; and the red-hearted Willow makes a much better pole than the Birch. In *very dry* ground, the Willow does not succeed. It makes short shoots in such ground, sends out laterals instead of going up, and seldom produces much besides fire-wood.

592. I cannot refrain from adding here, that I have now (March, 1828) several Willows, which have been *raised from the seed, this year, in my garden.* They get to be *four feet* high the first summer.

THE YEW.

In Latin, *Taxus;* in French, *If.*

593. The botanical characters are :—The male flowers are produced on separate trees from the fruit for the most part; they have neither empalement nor petals; but the gem is like a four-leaved cover; they have a great number of stamina which are joined at the bottom in a column longer than the gem, terminated by depressed summits, having obtuse borders and eight points, opening on each side of their base, casting their farina. The female flowers are like the male; having no impalements or petals, but having an oval acute-pointed germen, but no style, crowned by an obtuse stigma. The germen afterwards becomes a berry lengthened from the receptacle, globular at the top, and covered by a proper coat at bottom, open at the top, full of juice, and of a red colour; but as it dries, wastes away, including one oblong oval seed, the top of which, without the belly, is prominent.

594. "Though last not least", to use a saying that has been more than worn out for these last five hundred years. This is our native ENGLISH CEDAR. Its outward appearances are well known to us all; for, first or last, the most of us have seen a church-yard, however few, comparatively, may have been within the church, and there is scarcely a church-yard in England that does not present a Yew tree to the eyes of the beholder. The YEW tree sometimes rises to the height of forty or fifty feet, and would go a great deal higher if attention were paid in the pruning the side-shoots as the tree increases in height. It is frequently a very large tree. I have seen several, each of which has been more than fifteen feet round the trunk; and as I mentioned in a Rural Ride performed in the month of August, 1823, I measured the YEW TREE in the church-yard of the village of Selborne, in Hampshire, which was, at some distance from the ground, *twenty-three feet and eight inches*

in circumference. I had not the means of making a very exact measurement; but, my error could not be very great; and this is a monstrous circumference.

595. The YEW TREE attains an age beyond the possibility of human ascertainment, unless some national record were kept of the matter. Its growth is slow; but it appears never to lose any part of that which it gains. The wood surpasses, very far indeed, all other English wood, in point of durability, and of strength, and elasticity joined to both these. It has a red heart, like the imperishable RED CEDAR of America; but it is not odoriferous like the wood of the RED CEDAR; and it is very heavy, while the RED CEDAR is very light. The wood never perishes, or, at least, so say the country people. Gate-posts are sometimes made of it, and they have never been known to rot. It is very fine-grained and receives a very high polish. I have seen a kitchen dresser made of it, which being kept in good order, was as shining as any piece of furniture I ever saw. It is super-excellent for making the bows of the backs of wooden chairs; for making ox-bows, and, it is said, the bows, used by warriors formerly in this country, were made of this wood. Even the slender shoots of it are as tough, or tougher, than those of the HICKORY; and when they happen to get any considerable length, they become whip-handles, and other things, where great toughness and elasticity are required. I made a mistake in the article relating to the ELDER, paragraph 222, where I should have said, "An ELDER stake and a *Yew* hether," instead of an Elder stake and a *Hazel* hether, that would "make a hedge to last for ever."

596. The YEW appears to grow pretty nearly equally well upon all sorts of land, shallow or deep, dry or wet;

but it seems, from the frequency of our finding it on such land, to have been formerly, at any rate, grown principally upon chalky land. It resists all weather, stands uninjured on the bleakest of hills, where even the scrubbiest of thorns and underwood will hardly live. Big as the head of this tree generally is in proportion to its trunk, most heavily laden as it constantly is with leaf; forming as it does, such a hold for the wind, neither head nor trunk ever flinches, though in situations where it would be impossible to make an OAK grow, and where no other large tree could be prevented from being blown out of the ground.

597. The Yew is, or rather has been (for it is not much the fashion now), used for making *hedges*, as screens in and near gardens and round about houses, for which purpose it is the best material that can possibly be conceived. It is easily clipped into any form; its twigs are delicate and tough; it can be shaved close down to the ground; and it makes a fence or screen through which no wind can find its way; and being *ever-green*, it is very valuable on this account. People had more patience and diligence formerly than they have now; and, therefore, I have never heard of the planting of a Yew hedge in the whole course of my life. There are many, however, still remaining in England, but these have all descended to us from our ancestors, who lived in those dark ages, when men were foolish enough to think that patience ought to be required in the acquisition of things of great value, and that large estates ought not to be acquired in a few years by merely "watching the turn of the market." There is a hedge of this sort at PETWORTH, in *Sussex*, which, if I recollect rightly, I judged to be eleven feet wide, kept very closely and neatly clipped all across the top, and on the sides, from the top to the bottom. The bottom on one side of the hedge meets the top of a wall which supports a bank against a road or street. I

was quite as much delighted with this object, as I was with the house and park of LORD EGREMONT, the gate that opens to which, is not more than two hundred yards distance from this hedge.

598. The SEEDS of the Yew ought to be gathered when they are ripe, which is late in October, or early in November; and if they be sown immediately, in beds prepared like those pointed out for the ASH, they will come up the first year; but, perhaps, the better way would be, to preserve them in the manner directed for the seeds of the HAWTHORN, in paragraph 273, and then to sow them in any of the months between November and March, or in March of the second year. The plants will come up in the month of May, and then they are to be treated in precisely the same manner as that pointed out for the treatment of the RED CEDAR. See paragraph 171; see also, and pay particular attention to, paragraph 215; for unless you take the precautions there pointed out, you will fail in the raising of YEW TREES.

599. If YEW TREES are to form hedges, they should be planted in two rows, the rows at two feet apart, the plants at two feet apart in the row, and the plants in one row standing opposite the middle of the intervals of the plants in the other row. The year after planting, they might be cut down to within a foot of the ground, or lower; for the Yew will throw out new shoots. Prominent branches must be cut off, the lateral shoots trained along horizontally, and the lower ones close to the ground. In a few years, the trees in the two rows would interweave their branches. The clipping with the shears should be begun in a few years; and you may suffer the hedge to become as wide and as high as you please, by always leaving

a small part of the new growth not taken off by the shears.

600. As to the planting of *woods* of Yew Trees, few persons would think of such a thing; but it might be very conveniently and cheaply done, by raising the plants as above-directed, and by making them form part of a coppice, in precisely the same manner, and at the same distance, as directed for the TULIP TREE.

601. I have heard, and I believe, that Yew-leaves, or boughs, if, when a little *withered*, eaten by cattle or sheep, will *kill them*, and nearly instantly. Doubtless there was some old rule, relative to the poisonousness of the Yew, to induce the witches, in Macbeth, to make its "*slips*" part of the ingredients of their deadly cauldron. Horses, horn-cattle, and sheep, should not, therefore, be put into places where Yew trees, or hedges, have been recently clipped or trimmed up.

THE END.

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AMERICAN TREE AND SHRUB SEEDS.

I now offer these Seeds for sale. I propose to put complete assortments of the seeds up in boxes, and to sell each box for Five Pounds. There will be in the whole upwards of fifty different sorts of seeds of Trees and Shrubs; to which will be added about twenty sorts of Garden Seeds. Amongst the tree seeds will be *Walnuts*, *Hickory Nuts*, seeds of the *Sassafras*, of the *Birch*, of the *Plane*, of the *Red Cedar*, of the *Maple*, of the *Tulip*, of the *White Elm*, and amongst the shrubs, seeds of the *Pinckneya* (Georgia Bark), the *Comus Florida*, the *Kalmia Latifolia*, the *Kalmia Angustifolia*, the *Spice tree*, (laurus benzoin), the *Magnolia Glauca*, the *Magnolia Tripetula*, the *Magnolia Grandiflora*. I have mentioned the above, also, as part of the trees and shrubs. I shall put into each box, *two pounds* of fine *American Locust Seed*. These two pounds contain about twenty-four thousand seeds; and, if the instructions which I have given in the "WOODLANDS" be strictly adhered to, in the sowing of these seeds, almost every seed will propuce a tree; and a tree too, fit to go into a plantation next autumn.

Amongst the garden seeds, there will be several sorts of *Squash* or *Vegetable Marrow* seeds; two sorts of *Melon* seeds, one at least of *Cucumber* seeds, and a pint of three different sorts (a pint of each) of *Kidney* beans; besides which there will be three sorts of *Onion* seeds, and *Asparagus* seeds.

I forgot to mention one sort of seed, a small quantity of which is worth more than the whole five pounds; namely, the SEED of the SASSAFRAS, which no man in England ever possessed but myself. There is also the *Pinckneya* or *Georgia Bark*, which never has been in England before, except last year, when I sowed some of it, and reared a great number of plants.

There is some seed of the finest *Beets* in, such as produce roots far superior to any that I ever saw in England. There are several varieties of the early Indian corn; some white and some yellow.

Now, that part of these seeds which I shall sow, I shall make grow; and any other person may do the same if he will, by referring to the instructions contained in the "WOODLANDS." I shall, into each box of seeds, put a catalogue of its contents; and opposite the name of any tree or shrub mentioned in the WOODLANDS, I shall say, "See WOODLANDS." For instance, opposite to the seed of the BIRCH, I shall say, "See the WOODLANDS, paragraph 153." Then, when I come to that rare plant, the PINCKNEYA, or GEORGIA BARK, or to the KALMIA, I shall say also, "See the WOODLANDS, paragraph 153;" because all these seeds are to be sown and managed just in the same way as is directed for the Birch, the proceedings in the sowing of which, are the most curious that can possibly be conceived. If I had never done any thing in my life but rendered it an easy matter to raise the Birch from seed, which neither MILLER nor any other gardener ever accomplished, I should deserve the thanks of every body who is fond of trees. Till I made my experiments, with regard to the tender seeds of the BIRCH, I sowed not only that seed, but the seed of the GEORGIA BARK, the KALMIA, the AZALIA, the RHODODENDRON, and many others, in vain. Having made this discovery with regard to the BIRCH, there was no longer any difficulty with regard to any of these, which, as experienced gardeners well know, are never to be got from seed, but by mere luck.

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